ANNUAL REPORT
FOR THE WESTERN SNOWY PLOVER
AT SAN LUIS OBISPO COAST DISTRICT IN 2020

Prepared by

California State Parks
San Luis Obispo Coast District
750 Hearst Castle Road
San Simeon, CA 93452

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INTRODUCTION

This report summarizes the 2019-2020 western snowy plover (WSP) (*Charadrius nivosus nivosus*) non-breeding (winter) season and the 2020 WSP breeding season at California State Parks (CSP) San Luis Obispo Coast District (District). WSP breeding and wintering sites covered in this report include Hearst San Simeon State Park (HSSSP), Estero Bluffs State Park's (EBSP) Villa Creek Beach, Morro Strand State Beach (Morro Strand), and the Montaña de Oro State Park (MDO) Sandspit (Sandspit) (Appendix 1). The WSP that breed at these sites, along with those that breed at other locations along the Pacific coast of North America, were listed in 1993 as federally threatened under the Endangered Species Act (USFWS 1993). Collectively, these four sites within the District make up part of Recovery Unit 5, which supports the greatest number of WSP and has the greatest amount of available suitable habitat (USFWS 2007).

Current management within the District for the WSP consists of monitoring breeding and wintering activities, nesting area protection through symbolic fencing and signage, predator management, public outreach and education, enforcement of CSP regulations, and habitat enhancement through exotic plant eradication and dune stabilization.

Recorded monitoring for WSP within the District began in 1987 on the Sandspit and occurred periodically during the breeding season. More consistent monitoring of Villa Creek Beach, Morro Strand, and the Sandspit began in 2001 along with symbolically fencing the nesting area at Villa Creek Beach and Morro Strand. Beginning in 2002, San Simeon Creek Beach, Villa Creek Beach, Morro Strand, and the Sandspit were symbolically fenced, and most District beaches were monitored one to three times per week. By 2004, the primary breeding beaches were monitored five times per week. From 2011 to 2020, monitoring has occurred five to seven times per week on District beaches with HSSSP beaches monitored approximately once per week.

The District's goals and objectives for WSP management follow those of the System-wide Management Guidelines developed by CSP Natural Resources Division. During the 2020 breeding season, the District also continued to implement management measures set forth in the "Western Snowy Plover Management Plan", which was developed by the District. These guidelines inform the District's stewardship efforts to protect the WSP and manage its coastal habitat (CSP 2014, CSP 2019). The District continues to manage the WSP program in coordination with United State Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) and seeks to further recovery goals and objectives as identified by USFWS for Recovery Unit 5 where feasible.

Management activities were conducted under permits from both USFWS and CDFW. USFWS Recovery Permit Number TE-082237-7.2 was issued to the District with the District Superintendent as the Principal Officer. Authorized individuals listed on the permit are Lisa Andreano, Charlotte Bailey, Sylvia Bauer, Dylan Brown-Silva, Matt Campbell, Vincent Cicero, Eric Covington, Sara Delany, Jeff Ebner, Woodrow Eggers, Kevin Estrada, Matthew Fresquez, Margaret Harrington, Jodi Isaacs, Giancarlo Napolitano, Seth Ontiveros, Regena Orr, Marissa Pacheco, John Sayers, Donald Simms, and Michael Walgren. CDFW Scientific Collecting Permit Number SC-10633 was issued to the District with the District Superintendent as the

Principal Scientific Investigator. WSP responsibilities, including training, oversight, adequate supervision, and reporting, were delegated to Regena Orr for the CDFW permit. Individuals listed as working under the Principal Scientific Investigator on the permit are Lisa Andreano, Charlotte Bailey, Brian Barandon, Vincent Cicero, Jeff Ebner, Matthew Fresquez, Jodi Isaacs, Raven Lukehart, Regena Orr, Allen Potthoff, John Sayers, Lauren Seguy, Taryn Schingler-Kinney, and Michael Walgren.

Survey area descriptions, monitoring methods, current WSP management measures, WSP survey results, predator activity, banded WSP observations, injured/dead WSP observations, human activity, nest and egg numbers, nest fates, nest chronology, and nest distribution are all discussed within this report. Additionally, future management recommendations to enhance WSP survival and reproductive success are discussed.

METHODS

Survey Areas

The beaches monitored by the District during the 2020 WSP breeding season are located along 45 miles of coastline in San Luis Obispo County, California (Appendix 1). Nesting was recorded at three different beaches located within three park units. All of these beaches are within USFWS Recovery Unit 5 for the WSP.

In 2016, the District began consulting eBird, a real time, citizen science, online birding program developed by the Cornell Lab of Ornithology and National Audubon Society, to determine if WSP were using any previously unknown beaches within the District. Routine, weekly checks of eBird submissions continued in 2020. From these submissions, we were able to determine that there have been WSP sightings at the elephant seal (*Mirounga angustirostris*) viewing area and Pico Creek Beach within HSSSP and Cayucos State Beach (SB), just north of the pier where Cayucos Creek seasonally flows out to the ocean.

Hearst San Simeon State Park (CA-69 through CA-77)
The beaches within HSSSP stretch for 18 miles, from the San Luis Obispo County line south to Cambria (Appendix 1). The beaches north of San Simeon Creek Beach were acquired by CSP in 2005. Monitoring for WSP north of San Simeon Creek Beach began in 2007. Some of these beaches have little public visitation compared to the other beaches within the District. HSSSP encompasses the first eight beaches listed below.

San Carpoforo Creek Beach (CA-69)
The northernmost beach in the District, San Carpoforo Creek Beach falls under joint jurisdiction of the United States Forest Service and CSP. WSP utilize an approximately one-eighth mile stretch of a wide, fairly level area which is a mixture of sand and cobblestone substrate. The general nesting area is bordered to the north and east by San Carpoforo Creek, creating a small sandspit. East of the creek is a sandy area with sparse vegetation. Beyond the creek on the north end of the beach is a large sandy area littered with driftwood and low growing vegetation.

Adjoining this is a steep, densely vegetated hill that slopes up to Highway One. The west side of the nesting area is bordered by ocean. In general, the San Carpoforo Creek Beach area is highly dynamic, depending upon both tide and creek levels.

Point Sierra Nevada (CA-71)
The beach at Point Sierra Nevada is approximately one-half mile long and fairly narrow with marginal habitat. The beach is bordered by rocky bluffs to the north and south, a wide vegetated dune area to the east, and the ocean to the west.

Arroyo de la Cruz (CA-72)
Arroyo de la Cruz is a fairly wide, approximately one-quarter mile long, primarily sandy beach with cobblestone areas. Early in the season, it is bordered by Arroyo de la Cruz Creek to the north. Later in the season, when the creek no longer flows out to the ocean, it is bordered by the bluffs beyond the creek. The eastern edge of the beach is primarily bordered by a large, flat, sandy area with native vegetation. To the south of the beach is a heavily vegetated area along steeply sloping bluffs, while the ocean borders the beach to the west.

Sidney's Lagoon (also known as Arroyo de la Corral) (CA-73)
The main beach is less than one-eighth mile long. It is bordered on the north and south ends by small steep bluffs. The beach slopes down to a seasonal drainage running along Highway One, forming the eastern border. The ocean forms the border to the west. Sidney's Lagoon continued to be utilized by elephant seals in 2020, thus providing reduced habitat for WSP.

Piedras Blancas (CA-74)
This narrow sandy beach is approximately one-half mile in length. The beach is bordered to the north and south by bluffs and to the east by coastal scrub. The beach narrows at a small drainage and becomes dune backed. The west is bordered by the ocean. Piedras Blancas also continues to be utilized by elephant seals.

Arroyo Laguna (CA-75)
WSP primarily utilize the north and south ends of this approximately one-mile long beach. The northern sandy beach is bordered seasonally to the north by Adobe Creek and to the south by Oak Knoll Creek. To the east of this section of beach is grassland. The southern section is a sandy beach backed by dunes. Tortuga Creek near the southern boundary seasonally flows to the ocean. The ocean forms the western border of Arroyo Laguna. Arroyo Laguna is another beach which continues to be utilized by elephant seals.

San Simeon Creek Beach (CA-77)
This approximately one-quarter mile long beach is bounded by coastal bluffs to the south, the ocean to the west and San Simeon Creek to the north. Highway One also runs above the eastern edge of the site with a campground east of the highway.

Santa Rosa Creek Beach
Santa Rosa Creek Beach is located within the town of Cambria and falls under joint jurisdiction of San Luis Obispo County Parks and CSP. The beach is approximately one-half mile in length.

It is bounded by coastal bluffs to the north and south, Santa Rosa Creek lagoon and Shamel Park to the east, and the ocean to the west.

Villa Creek Beach (CA-78)
Villa Creek Beach is located north of the town of Cayucos along Highway One (Appendix 1). It is situated at the northern boundary of EBSP and is one-third of a mile in length. Villa Creek runs through the northwestern portion of the property, and a large rocky bluff sits to the west of the creek mouth. A small sandy beach area, referred to as West of Villa Creek, develops later in the breeding season as the creek flow diminishes. This area has occasionally been used for nesting. Near the east bank of the creek are mudflats and annual grassland. This area is referred to as the Back Area and is also occasionally used for nesting. A small sandspit beach borders the south side of the creek mouth.

The main section of beach used for nesting consists of medium grained sand with large driftwood on a narrow sloping beach, which is widest at the north and south ends. Backing the beach to the northeast is a mix of driftwood and coastal scrub. The wetland at the south end of the beach seasonally flows out to the ocean in wet years. The ocean borders Villa Creek Beach to the southwest.

Public access to Villa Creek Beach is from a parking lot adjacent to Highway One. A one-quarter mile trail leads from the parking lot to the Bluff Trail and Villa Creek Beach.

Immediately southeast of Villa Creek Beach are two pocket beaches backed by bluffs and bordered on the northwest and southeast by rocky bluffs. The northern pocket beach is slightly larger than the southern, and both are heavily influenced by tide. These pocket beaches have been used infrequently in past years as nesting sites by WSP.

Cayucos SB
Cayucos SB is located within the city of Cayucos along Highway One (Appendix 1). It is approximately a half mile in length. The northern end of the beach contains a 950-foot-long fishing pier and creek that seasonally drains out into the ocean. The beach is bordered by two parking lots, residential houses, restaurants, shops, and hotels on the east and the ocean on the west. The beach is a very popular recreational area for families with a swing set located directly on the beach and is directly adjacent to the downtown area with restaurants, shops, and hotels. WSP infrequently winter at Cayucos SB but do not breed here.

Morro Strand (also known as Atascadero Beach) (CA-80)
Morro Strand is comprised of two units. The Northern Unit is located within the town of Cayucos, and the Southern Unit is located within the City of Morro Bay (City) (Appendix 1).

The Northern Unit, referred to as Old Creek, is approximately one and one-third miles in length. A large portion of Old Creek is narrow and sandy, backed to the east by steep bluffs topped with houses. The main beach is approximately one-quarter mile in length and is backed to the east by two parking lots. Old Creek runs between the two parking lots and bisects the main beach, when it flows out to the ocean. Small areas of coastal salt marsh and riparian vegetation grow near Old

Creek, also helping form the border to the east. To the northwest and southeast of the main beach are residential areas, while the ocean forms the border to the west.

Historically, WSP have infrequently wintered at Old Creek but have not been known to nest there. Thus, as with previous years, Old Creek was not monitored during the 2020 breeding season.

The Southern Unit, henceforth referred to as Morro Strand, is the main nesting area at Morro Strand and was monitored during the 2020 breeding season. This beach is approximately two miles long, extending from the area adjacent to the Morro Strand Campground south to the CSP boundary west of Highway 41. WSP habitat at Morro Strand is broken up into four sections separated by nine beach access corridors spread throughout the length of the beach.

The Campground-Hatteras section has corridors located at the campground kiosk, north bathroom, and south bathroom. The corridor at the southern end of the campground, referred to as Alva Paul, was inaccessible during the 2020 breeding season due to the creek creating a lagoon in the area. For the first time since 2010, WSP nested in the section from Alva Paul to the north end of Morro Strand Campground.

The Hatteras-Azure section has a row of houses backing the foredunes and access corridors located at Hatteras Street, Easter Street, Sienna Street, and Azure Street. A small beach access parking lot and restrooms are at the east end of the Azure Street Corridor.

The Azure-Boardwalk section encompasses the area from the Azure Street Corridor south to the Boardwalk Corridor. This section is broken up into approximately equal halves by a seasonal drainage referred to as North Playa or North Spoils. Bordering this section to the east are coastal dune scrub and coastal dune wetlands backed by the Cloisters housing development.

The Boardwalk-Highway 41 section extends from the Boardwalk Corridor south to the CSP/City boundary west of Highway 41. Bordering this section to the east is coastal dune scrub backed by Morro Bay High School. In recent years, non-native sea rocket (*Cakile maritima*) has been spreading into the WSP breeding habitat in this section. A small parking lot for beach access also lies at the east end of the Highway 41 Corridor.

Aside from elevated areas near North Playa and South Spoils that contain coarse rocks, pebbles, and sand, Morro Strand consists primarily of flat sandy beach. To the east, low foredunes with coastal dune vegetation back the entire length of the beach. The ocean forms the boundary to the west.

Sandspit (CA-81)

The Sandspit is a barrier dune system located between the Pacific Ocean and the Morro Bay estuary within the communities of Morro Bay and Baywood Park/Los Osos. The Sandspit falls under joint jurisdiction of the City and CSP, with a small portion being privately owned. Except for the small privately-owned segment, the northernmost mile of beach is City property, while the remaining southern area is within MDO (Appendix 1). Although the CSP boundary has not always been demarcated clearly, CSP manages the nesting area in this area by installing

symbolic fencing and signage. Therefore, nests found on the small area of private property are included with the CSP nest numbers.

The length of the contiguous beach from the northern tip of the Sandspit to the southern end at Hazard Canyon is approximately five and one-half miles. The majority of the Sandspit south of the City property is sandy beach with low, sparsely vegetated foredunes that are backed by higher, more stabilized, densely vegetated dunes. Large barren sand sheets are scattered throughout the dune system. In contrast, the southernmost mile of beach is backed by steep sandy bluffs reaching approximately 75-100 feet above sea level. On the eastern edge (bayside), the Sandspit landscape is dominated by barren sand sheets and provides little suitable nesting habitat for WSP. Thus, as with previous seasons, the bayside of the Sandspit was not monitored in 2020.

The Sandspit has seven rescue markers at roughly half mile intervals. These start with Rescue Marker (RM) 1, located near Army Road in the south, and end at RM7, located just south of Jetty Beach on City property. When monitoring, the rescue markers and several other markers are used to divide the beach into smaller areas to analyze the data collected at smaller scales.

Southern access to the Sandspit consisted of five symbolically fenced access trails within MDO. Northern access to the Sandspit consists of three access corridors (one on CSP property and two on City property) linking the east (bay) side to the west (ocean) side. These three corridors, as well as the northern tip of the Sandspit, are accessed by boat, canoe, kayak, stand-up paddleboard, and surfboard.

Park Attendance

The District manages several popular parks and beaches that visitors frequent throughout the year. Among these are HSSSP, EBSP (which includes Villa Creek Beach), Morro Strand, and MDO (which includes the Sandspit). Park attendance data pertaining to campground utilization and day use are typically collected by CSP Rangers and maintained in logbooks throughout the year. This year however, due to Districtwide campground closures in response to the Coronavirus Infectious Disease 2019 (COVID-19) pandemic, such attendance data was not collected. The COVID-19 pandemic caused an increase in outdoor recreation across San Luis Obispo County for people looking to recreate in a safe way. Monitors frequently noted large amounts of visitors on all District beaches this year compared to previous years. A spike in trespass and dog contacts on Morro Strand and the Sandspit supports these observations. Morro Strand had 573 and the Sandspit had 757 more incidences of trespass during the 2020 breeding season compared to the 2019 breeding season. Morro Strand also had 91 more dog contacts in 2020 than in 2019. An additional instance of an observed increase in park attendance occurred on July 4th when 33 vehicles were parked at Villa Creek Beach. See the “Human Activities” section for more information.

Monitoring

Monitoring on District beaches in 2020 began March 2nd and ended September 24th. Monitoring was conducted five to seven days per week at Villa Creek Beach, Morro Strand, and the Sandspit, and approximately once per week at beaches within HSSSP. Monitoring efforts at San Carpoforo Creek Beach in HSSSP were suspended at the beginning of June due to unclear property boundary descriptions. At Villa Creek Beach and the Sandspit, nest searches were conducted four times per week inside of the symbolic fencing and one to two times per week outside of the fencing. At Morro Strand, nest searches were conducted three times per week inside of the symbolic fencing and two to four times per week outside of the fencing. Weekend monitoring was conducted 29 times between May 9th and August 16th and was primarily conducted in order to increase CSP presence on District beaches during the busier summer months. Monitoring at Villa Creek Beach, Morro Strand, and the Sandspit was reduced to three days per week in mid-August and was further reduced to two days per week at the start of September due to no active WSP nests.

All WSP monitors were trained by USFWS authorized individuals. Monitoring was conducted in the morning or early afternoon from approximately 8:00 am to 2:00 pm with a focus on typical WSP nesting areas between the foredunes and intertidal zone. Monitors also searched the Back Area at Villa Creek Beach, the EBSP coastline south of Villa Creek Beach, and the back dunes at the Sandspit once per week to check for WSP breeding activity. The Sandspit was monitored by two people to allow for adequate coverage. To accomplish this, the Sandspit was divided into northern and southern sections between RM3 and RM4 at a location referred to as Rocky Mounds. All monitoring was conducted on foot by walking slow, meandering transects and was assisted with the use of binoculars.

In a normal year, Morro Bay Harbor Patrol ferries a WSP monitor by boat across Morro Bay to the northern end of the Sandspit to enable monitoring the north half of the Sandspit. Boat access was limited this year due to the COVID-19 pandemic. Access to the north end of the Sandspit was accomplished by utilizing a Honda Pioneer Utility Task Vehicle to transport monitors to conduct regular nest monitoring.

Monitoring activities included observing adult WSP behavior, locating scrapes and nests, mapping nest locations utilizing Global Positioning System (GPS) technology, tracking nests to determine fates, floating nests found at completed clutch sizes, recording evidence and observations of predator and human activity, recording evidence and observations of chicks and fledglings, and maintaining/repairing signs and symbolic fencing. While in the field, all data was recorded in a field notebook for that specific beach. All nest data, including photographs and a hand-drawn map of each nest that was found, was also recorded on a nest card (Appendix 2) and entered into a computer database.

Monitors also conducted population censuses to determine numbers of WSP on District beaches throughout the year. Annual range-wide winter and breeding window surveys have been conducted on District beaches since 2002 and were conducted again in 2020 (Appendices 3 and 4). The primary purpose of these surveys is to obtain minimum estimates of the number of wintering and breeding WSP at current, historic, or potential sites over time. Each year, USFWS

designates a specific time window during which these range-wide surveys are to be conducted. For the winter survey, the window falls between December 1st and January 31st during a migratory period for WSP when both coastal and inland populations can overlap in distribution and cannot be distinguished visually. Therefore, the winter survey does not represent a count of the Pacific Coast population, but a minimum count of coastal and inland birds combined. The annual breeding window survey falls between May 24th and June 7th during a non-migratory period for WSP. This narrower time frame minimizes the chance of recounting birds moving between sites, thus yielding a more accurate population estimate of breeding WSP at specific sites.

During monitoring, any observation of a WSP with colored leg bands, as well as the individual's behavior, location, and observation time, was documented. These observations were entered into a computer database and shared via a listserv to determine the age and origin of the WSP (Appendices 5 and 6).

If an unhealthy, injured, or dead WSP was observed while monitoring (Appendix 7), the District's "Procedures for handling injured, sick, or dead WSP (including chicks and eggs)" protocol was followed.

The District has been and will continue to be involved with the WSP Working Group for USFWS Recovery Unit 5 through attendance at meetings and involvement with the range-wide electronic mailing list, which connects all WSP interested parties together through email. The WSP Program Coordinator also assists Recovery Unit 5 by coordinating the winter (non-breeding) and breeding window surveys. These efforts facilitate consistent WSP management methodologies and reporting throughout the range.

Floating Eggs

To determine the estimated hatch date (EHD) for a nest discovered with a completed clutch, the process of egg "floating" was employed. This process was carried out by a person permitted by USFWS to float eggs. As an essential part of the process, every effort was made to collect data in minimal time while exercising the necessary care to ensure that eggs were not damaged. The process can be described as follows:

First, eggs were checked for signs of cracks that appear before hatching. If cracks were found, or if the chick inside an egg was heard tapping on the shell or peeping, the floating process was discontinued, as such an egg would be in a late development stage very near hatching. Otherwise, an egg was carefully placed in a small, clear container of clean, tepid water. If an egg was completely submerged, a measurement was taken of the angle of the longitudinal axis of the egg to a horizontal line. If the egg was floating with any part of it exposed above water, a measurement was taken of the diameter of the exposed portion. These measurements were compared to a chart of float measurements corresponding to stages of embryo growth developed for WSP to determine an EHD. Floated egg data for 2020 can be found in Appendix 8.

Determining Nest Fate

During the 2020 breeding season, the District continued following USFWS Recovery Unit Five protocols for determining nest hatch success. To assist with this effort, emphasis has been placed

on minimizing the proportion of nests assigned an "unknown fate". To accomplish this, an EHD must be determined for each nest found. For nests with a known clutch completion date, an EHD was calculated by adding 27 days (the average incubation period) from the clutch completion date. For any floated nest, floated egg measurements were compared to stages of expected growth development, with an EHD calculated accordingly.

The modal clutch size for WSP is three eggs, with an expected range of two to four. A scrape was considered a nest if it contained at least one egg. Single or "dropped" eggs that were not found in a recognizable scrape were not considered to be a nest. A nest containing two or more eggs and with an indication of incubating activity (presence of incubating WSP, WSP tracks, nest lining, adult WSP nearby, etc.) was considered to be an active nest.

There are three possible nest fates as outlined by Recovery Unit Five:

a) Hatch- Pips/chicks in the nest or indirect evidence suggesting hatch.
b) Fail- Direct evidence of loss, depredation, or eggs gone before expected hatch date.
c) Unknown- Eggs gone and no physical sign of fate.

A "Hatch" designation is the most definitive, and evidence of this fate, such as chicks in the nest or in its immediate vicinity, or pips found in an empty nest bowl, is often quite obvious and difficult to misinterpret. A nest with at least one hatched egg was considered a successful hatch. If pips or chicks were not present, other indications were used in their absence, including flattened scrapes, distracting adults, eggshell halves nearby, and brooding tracks, if such evidence corresponded with the nest's EHD. Typically, several of these indirect indications must be present in order to constitute solid evidence for a hatch. In such cases, the monitor evaluated all the evidence in order to reach a decisive conclusion of hatch or fail. The total number of hatching fate nests were then divided by the total number of nests with known fates to determine the season's hatch rate.

The "Fail" designation is often more complex, however any nest found empty more than two days before its EHD was typically considered to have failed unless there was definitive evidence to the contrary. When a nest was determined to have failed, the available evidence was then analyzed to determine the cause of the failure. The causes of failed nests were classified as depredation, abandonment, tide, wind, take, or unknown.

Nests were determined to "Fail" as a result of wildlife depredation when avian or mammalian predator tracks were found at the nest bowl and all of the eggs in the nest were gone, or if eggshell pieces or egg fluid were found in the nest bowl. Nests were considered abandoned if the eggs were still visible, but no WSP tracks or adults were noted near the nest for over one week. Tide losses were determined when nests went missing below the high tide line, and eggs were found scattered in the wrack. A nest was considered lost due to wind when the eggs became completely buried by sand in one day, and there was no evidence of further incubation. Nests were confirmed to "Fail" by take when human, domestic dog, horse tracks, or any other evidence of human activity was found at the nest bowl and this activity was directly responsible for the eggs failing to hatch. Nests were determined to "Fail" due to an unknown cause where there was no conclusive evidence for the cause of the missing eggs.

In previous years, a nest was determined to have an "Unknown Fate" when there was ambiguous support for both "Hatch" and "Fail" fates. This fate is typically assigned if the predicted hatch date is unknown, and there is no physical evidence of the nest's fate, or if at least one egg disappears after 26 days of incubation with no clear evidence as to the cause of its disappearance. An "Unknown Fate" could also be assigned if a nest shows evidence suggestive of both "Hatch" and "Fail" fates but neither one can be conclusively determined. No nests in 2020 were assigned an "Unknown Fate" as monitors were able to determine whether each nest in the District had hatched or failed.

Current Management

Nesting Area Protection

By February 28th, the main District beaches with WSP nesting habitat were symbolically fenced above the high tide line to demarcate the area reserved for nesting. The only two HSSSP beaches with symbolic fencing in 2020 were San Simeon Creek Beach and San Carpoforo Creek Beach. Symbolic fencing was installed at San Carpoforo Creek Beach on April 2nd and on the southern end of San Simeon Creek Beach on February 27th. In addition, Sidney's Lagoon has a permanent fence surrounding the beach area prohibiting public access for the protection of elephant seals. On May 20th, symbolic fence was installed in front of the Morro Strand Campground. This was the first time nests have been discovered in that area since 2010. Additional no-climb fencing was installed along the length of the campground to further protect the nesting habitat in this area.

Fencing consisted of metal eye-posts strung with polypropylene rope. Signs were placed at regular intervals along the entire length of the fencing informing the public of the closed WSP nesting habitat. Beige signs were used at Villa Creek Beach to lessen the impact on the scenic viewshed.

All beaches had corridors at the main access points, which allowed for continued public recreation. The corridors at Morro Strand and the Sandspit had yellow signs, which allowed these access points to be clearly seen from a distance. Signs directing people to access corridors were also placed at regular intervals along the back fence sections at these beaches. Regulatory signs were posted at CSP beach access corridors stating that dogs were prohibited, and "No Kite Flying" signs were posted at the access points to San Simeon Creek Beach, Villa Creek Beach, Morro Strand, and the Sandspit. "No Drone" signs were on display at the Villa Creek Beach access point, Morro Strand Campground, Azure Street Corridor, and Highway 41 Corridor, and the Sandspit Trail parking lot.

Maps displaying the visitor's current location and nearby beach access corridors were placed on the bayside of the Sandspit at the accessible landing spots. Red flags were also placed on the bayside at corridor entrances so that kayakers coming from the east side of the bay could navigate toward a corridor.

Symbolic fences were removed during the last week of September from the main WSP breeding beaches. Fencing was removed from San Carpoforo Creek Beach on June 3rd and San Simeon Creek Beach on June 30th.

Habitat Enhancement

Symbolically fencing WSP habitat not only protects WSP nests but also allows native vegetation to expand into areas that would otherwise be trampled. Erosion of sand into areas such as the Morro Bay estuary is also minimized, and WSP breeding areas are further stabilized.

In early 2020, District staff continued maintenance level work targeting invasive New Zealand spinach (*Tetragonia tetragonioides*), Russian thistle (*Salsola spp.*), sea rocket, and tumbleweed (*Salsola tragus*) at Villa Creek Beach. Efforts to eradicate non-native iceplant (*Carpobrotus edulis*) and European beachgrass (*Ammophila arenaria*) in the Morro Strand foredunes were completed in 2016, but efforts continue at a maintenance level to maintain the restored area.

In June 2012, an iceplant control project was initiated in the Morro Dunes Natural Preserve within MDO. The iceplant grows throughout the Sandspit, covering open sandy areas that have potential to be WSP breeding habitat. An additional $280,000 was acquired for the restoration effort and funded the project through beginning of 2020. Between October 2019 and February 2020, an area of approximately 400 acres of iceplant between Army Road and RM5 was treated with herbicide. Treatments occur during this time to avoid working during the WSP breeding season. It is expected that an increase in potential WSP nesting habitat will result from this project. As part of this project, California Conservation Corps crews scattered rice straw, installed rice straw waddles and bales, planted lupine (*Lupinus spp.*), and scattered native seeds on the unvegetated back dunes to help establish plants, which will stabilize the dunes and prevent sand movement. Through a $5,000 grant from the Morro Bay National Estuary Program, the Coastal San Luis Resource Conservation District monitored the treated 400-acre area, and new interpretation panels for the Sandspit parking lot are being developed.

Habitat Condition

Though sand movement and changes on beaches occur each winter, the beaches typically build back up throughout the breeding season. The overall width of the beaches was narrowed significantly in some locations and high tides regularly washed over the beaches and up to the foredunes. These changes caused the overall area of suitable beach for WSP nesting to be restricted in size and resulted in tide failed nests at Morro Strand and the Sandspit. These changes to WSP habitat persisted through the breeding season and, in conjunction with increased depredation of nests, may have contributed to 2020 being the least productive breeding season in the District since consistent monitoring began in 2002.

Predator Management

Populations of WSP nest predators foraging at District beaches appear to be steadily increasing beyond their normal limits due to human influences on the environment. Factors such as habitat encroachment and the availability of supplemental food sources continue to consolidate predator populations into smaller habitat areas, while often boosting their localized numbers beyond a natural carrying capacity. This has resulted in an increase in the population density of certain predators at various locations throughout the District, which has caused an unnatural increase in

depredation stress placed upon prey species such as WSP. For these reasons, the District incorporates predator management strategies into its WSP conservation program in order to decrease WSP nest depredation rates during the breeding season.

Monitors recorded the presence of all WSP predators detected on District beaches throughout the 2020 breeding season. Whenever a documented WSP nest failed, all available evidence was assessed to determine whether the nest was depredated and which species was responsible for the depredation. Data from these observations were maintained in daily monitoring logs and analyzed to advise current and future predator management strategies. Due to the significant increase in WSP nest depredation observed over recent years, additional measures were taken in 2020 to mitigate the effects of predators on the District's WSP breeding population. These measures included the reinstatement of a predator removal program funded by USFWS, and the utilization of 2.5-foot x 2.5-foot x 3-foot mini-exclosures to protect WSP nests in certain areas of Morro Strand and the Sandspit. A detailed discussion of predator presence across District beaches and the management strategies employed to protect nesting WSP this year can be found in the "Predators" section.

Enforcement

Throughout the WSP breeding season, monitors maintained positive working relationships with CSP Rangers. Ranger patrols encompass a broad area, including beaches harboring WSP habitat and nesting activity. While on beach patrol, Ranger vehicle activity was restricted to the wet sand area with a speed limit of less than ten miles per hour.

A District Superintendent's posted order protects WSP nesting areas by seasonally closing nesting areas to all public use. The designated closed areas are identified with barriers or fencing and posted signs indicating the prohibition of entry. With the posted order, Rangers are able to issue citations to people violating the order.

The increase in popularity of unmanned aerial systems (also known as drones) has numerous negative impacts including: protection of threatened species; threats to cultural and natural resources; fire danger; public safety; recreational conflicts; and impacts on visitor privacy. Therefore, the District Superintendent signed a posted order stating that no person shall launch, land, or operate a powered unmanned aircraft, or an unmanned glider aircraft within any park unit of the District, unless authorized by the District Superintendent.

While WSP monitors were in the field, they routinely encountered visitors in violation of CSP regulations, some of which represented threats to WSP. When necessary, monitors called Rangers for help in enforcing regulations. Violations for which Rangers were contacted include dogs on the beach, trespassing into the closed breeding area, camping, and kite/drone flying.

District beaches typically see an increase in visitation and violations over the weekend of July 4th. As in past years, WSP monitors again assisted Rangers with the enforcement of regulations during the holiday. The results of this effort, as well as any other incidents in which Rangers were notified, can be found in the "Human Activities" section.

Public Education and Outreach

Public education is an important aspect of the WSP program. Although, most of this year's usual events were either canceled or altered to virtual due to the COVID-19 pandemic.

Pamphlet holders at Morro Strand and the Sandspit parking lot were stocked throughout the season with the "WSP: Sharing the Beach" brochures provided by CSP headquarters, and "Dog on Leash" brochures created by Morro Coast Audubon Society (MCAS). As part of an ongoing effort to educate park visitors, four WSP interpretive panels continued to provide information at Villa Creek Beach, Morro Strand (Azure Street and Highway 41 Corridors), and MDO.

CSP WSP webpages were updated and linked to the Morro Strand and MDO park webpages in 2020.

The 2020 season also marked the fifteenth consecutive year of the District displaying children's art signs along the symbolic fencing. This MCAS sponsored project involved several beach landowners, as well as children from the community who contributed artwork around a theme of WSP protection.

At the beginning of the WSP breeding season, an email was sent to all District employees announcing the start of the season with information on the WSP.

Prior to COVID-19, two WSP walks with a total of 27 people were conducted during the Morro Bay Winter Bird Festival, and WSP presentations were given during the State of the Bay lecture series and to the Cal Poly Surfrider Club prior to a beach clean-up on the Sandspit. Another presentation on the District's WSP conservation program was given via YouTube Live during California Biodiversity Week with over 130 views.

Outreach also occurs through regular contact between WSP monitors and the public on District beaches. Members of the public often approach monitors with questions about WSP activity and other beach related subjects. All WSP monitor contacts followed COVID-19 protocols by wearing face masks and maintaining at least six feet distance from visitors. See the "Human Activities" section for more details.

Training

All WSP monitors were trained by USFWS authorized individuals both in the field and in a classroom setting. This training lasted over a period of several weeks and consisted of instruction regarding the biology and behavior of WSP, rules and regulations concerning WSP, and WSP monitoring protocols. WSP monitors also gave three socially distanced talks to other CSP employees and docents with the goal of educating them on the WSP program.

Volunteer Efforts

Volunteers are a benefit to the District's WSP program. In 2020, two volunteers, who have assisted with the WSP program for 3 and 16 years, contributed 49.5 hours of service through WSP monitoring, outreach, and fencing prior to COVID-19 (Table 1). This year for the health and safety of our volunteers, the volunteer program was temporarily suspended due to COVID-19.

Table 1: Volunteer Hours and Activities in 2020.

Volunteer Activities	Hours
WSP Monitoring	40.5
Outreach	4
Fencing	5
Total	49.5

RESULTS

Wintering WSP

To monitor wintering populations on District beaches, censuses were conducted from October 2019 through February 2020 (Table 2 and Appendix 9).

Table 2: Summary of Winter Census Results from District Beaches in 2020.

Location	# of Winter Censuses	Low Count	High Count	Average[1]
San Carpoforo Creek Beach	17	0	59	34
Point Sierra Nevada	16	0	1	1
Arroyo de la Cruz	17	0	32	5
Sidney's Lagoon	17	0	15	3
Piedras Blancas	16	0	0	0
Arroyo Laguna	17	0	79	21
San Simeon Creek Beach	17	0	34	6
Santa Rosa Creek Beach	17	11	121	49
HSSSP	17[2]	39[3]	181[3]	117[3]
Villa Creek Beach	20	8	56	31
Morro Srand North (Old Creek)	18	0	20	2
Morro Strand South	19	37	164	78
Morro Strand	19[4]	42[5]	164[5]	79[5]
Sandspit[6]	19	10	64	38

1. Averages are rounded up
2. Total number of days censuses were conducted throughout HSSSP
3. Data obtained from HSSSP cumulative total
4. Total number of days censuses were conducted throughout Morro Strand
5. Data obtained from Morro Strand cumulative total
6. Data does not include City property

District beaches have historically provided high quality wintering habitat for WSP. The beaches in HSSSP continue to be more popular with wintering WSP than with breeding season WSP. During the winter season, WSP were recorded on all HSSSP beaches except for Piedras Blancas. Other beaches within HSSSP that had WSP sightings recorded on eBird included: the elephant seal viewing area, Pico Creek Beach, and Cayucos SB. The highest winter count across all District beaches was on January 14th with 369 WSP observed. This day was also the annual range-wide winter window survey (Appendix 3).

WSP Breeding Population

The breeding season WSP population on District beaches was monitored by conducting monthly population censuses between March and September (Table 3 and Appendix 9).

Table 3: Summary of Breeding Census Results from District Beaches in 2020.

Location	# of Breeding Window Censuses	Low Count	High Count	Average[1]
San Carpoforo Creek Beach	3	0	29	11
Point Sierra Nevada	6	0	1	1
Arroyo de la Cruz	6	0	0	0
Sidney's Lagoon	6	0	16	3
Piedras Blancas	6	0	4	1
Arroyo Laguna	6	0	53	19
San Simeon Creek Beach	6	0	1	1
Santa Rosa Creek Beach	6	0	27	10
HSSSP	6 [2]	0[3]	98[3]	39[3]
Villa Creek Beach	8	5	41	15
Morro Strand	8	5	140	44
Sandspit[4]	8	36	81	51

1. Averages are rounded up
2. Total number of days censuses were conducted throughout HSSSP
3. Data obtained from HSSSP cumulative total
4. Data does not include City property

This year, the District's WSP population census on May 19th was conducted as part of the annual range-wide breeding window survey (Table 4 and Appendix 4). The District utilizes data from these annual range-wide breeding window surveys to determine the number of WSP breeding adults present on its beaches relative to previous years and the District's breeding bird management potential (BBMP) as defined by the USFWS Recovery Plan for WSP (USFWS 2007). Several beaches within HSSSP have not been assigned a BBMP.

Table 4: Breeding Window Survey Results at District Beaches in 2020.

Location	Male	Female	Unknown	Juvenile	Chick	Total[1]	BBMP
San Carpoforo Creek Beach[2]	0	0	0	0	0	0	16
Point Sierra Nevada	0	0	0	0	0	0	-
Arroyo de la Cruz	0	0	0	0	0	0	-
Sidney's Lagoon	0	0	0	0	0	0	-
Piedras Blancas	0	0	0	0	0	0	-
Arroyo Laguna[2]	0	0	0	0	0	0	16
San Simeon Creek Beach	0	0	0	0	0	0	-
Santa Rosa Creek Beach	0	0	0	0	0	0	-
HSSSP	0	0	0	0	0	0	16
Villa Creek Beach	4	4	0	0	2	8	25
Morro Strand	10	10	3	0	0	23	36
Sandspit[3]	24	22	0	0	0	46	82
District	38	36	3	0	2	77	159

1. Total does not include juveniles or chicks
2. BBMP is a combined total for San Carpoforo Creek Beach and Arroyo Laguna
3. Data does not include City Property

As observed during 2020's range-wide breeding window survey, the number of adult WSP utilizing District beaches this season was 77 individuals. Cumulative results from these surveys show that the District's breeding season WSP population has changed over time with a general decline over the last four years and with the same number of adult individuals being counted in 2020 as were counted in 2019 (Appendix 4 and Figure 5).

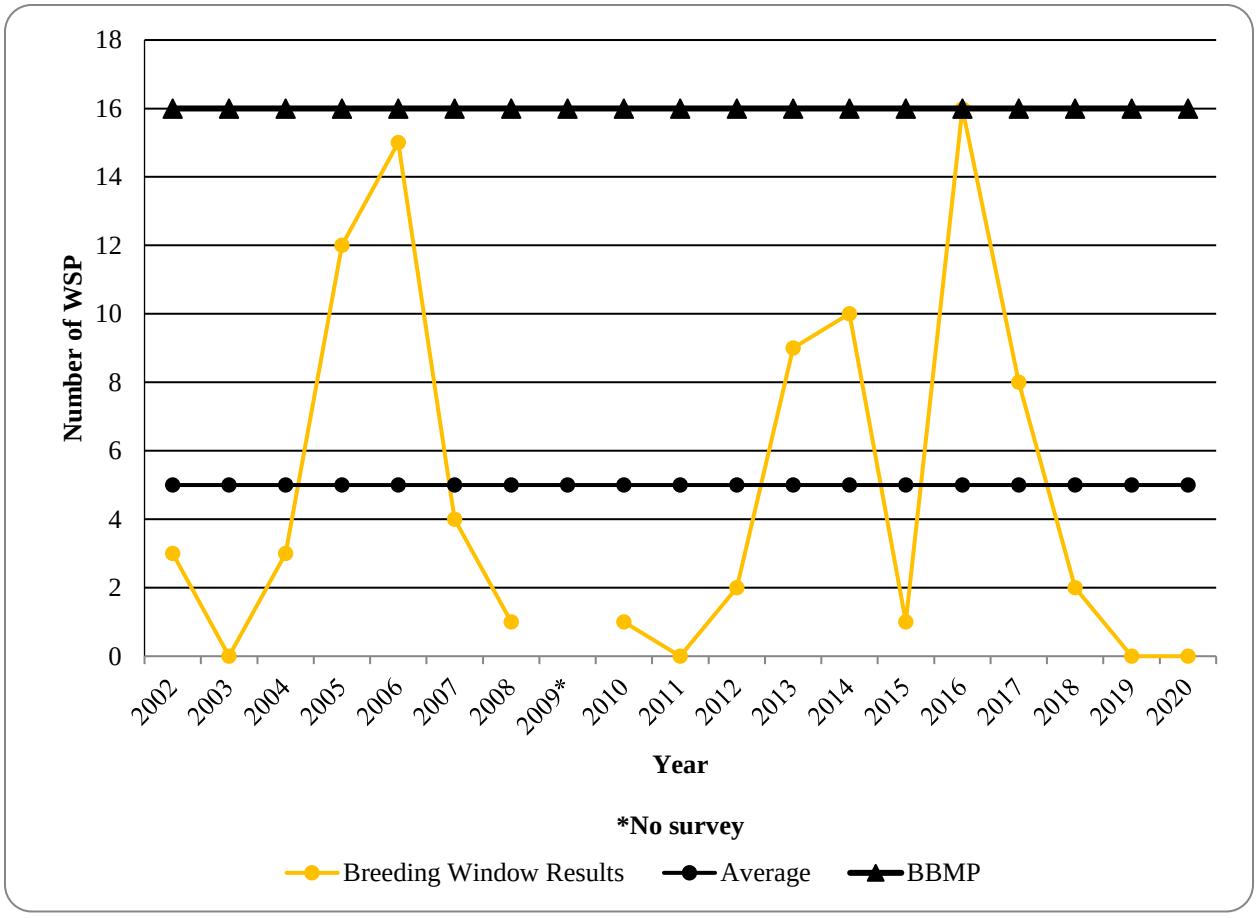
In addition to censuses, the minimum number of breeding adults utilizing District beaches at any given time can be derived from a calculation using the number of actively nesting pairs and the number of males known to be concurrently raising chicks. As each active WSP nest requires the presence of two adult WSP, and each unfledged brood of chicks requires the presence of one adult male WSP, the minimum number of breeding adults utilizing a particular beach at any given time can be calculated with the formula "number of active nests × 2 + concurrent number of unfledged broods on beach = minimum number of breeding adults". When determining the minimum adult breeding population for an entire breeding season using this method (Table 5), the date from that season with the highest known sum of actively nesting adults and adults concurrently raising chicks is selected. The minimum number of breeding adults that utilized District beaches this season as calculated with this method would be at least 56 individuals. However, this is less than the number of breeding adults that were confirmed to be utilizing District beaches during the range-wide breeding window survey.

Table 5: Minimum Number of Breeding Adults at District Beaches in 2020.

Location	Date of Maximum Breeding Activity	# of Active Nests	Males with chicks	Total # of Breeding Adults	BBMP
HSSSP	N/A	0	0	0	16
Villa Creek Beach	5/27-5/29; 5/31-6/1; 6/5-6/14	3	1	7	25
Morro Strand	6/8	9	0	18	36
Sandspit	7/8/-7/9	18	3	39	82
District	7/1	25	6	56	159

The breeding WSP population at HSSSP beaches has historically been low and remains so. HSSSP has only reached its BBMP of 16 once in the past 17 years. The average has been five breeding adults (Figure 1).

Figure 1: Breeding Window Survey Results at HSSSP from 2002-2020.

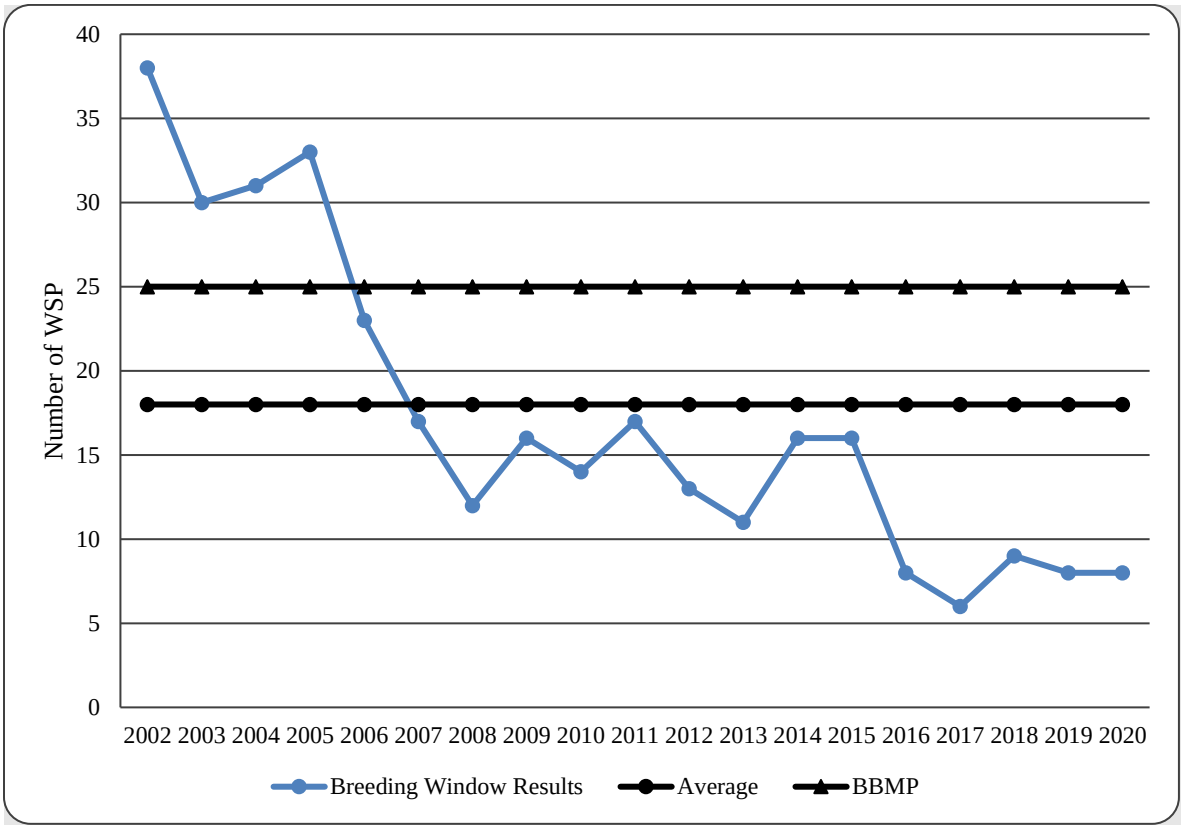


*No data collected in 2009

Villa Creek Beach has seen a steady decline since 2002, the year after monitoring began and the beach was first made publicly accessible (Figure 2). Villa Creek Beach breeding adult numbers have been below the Recovery Plan BBMP of 25 since 2006. Utilizing the maximum number of

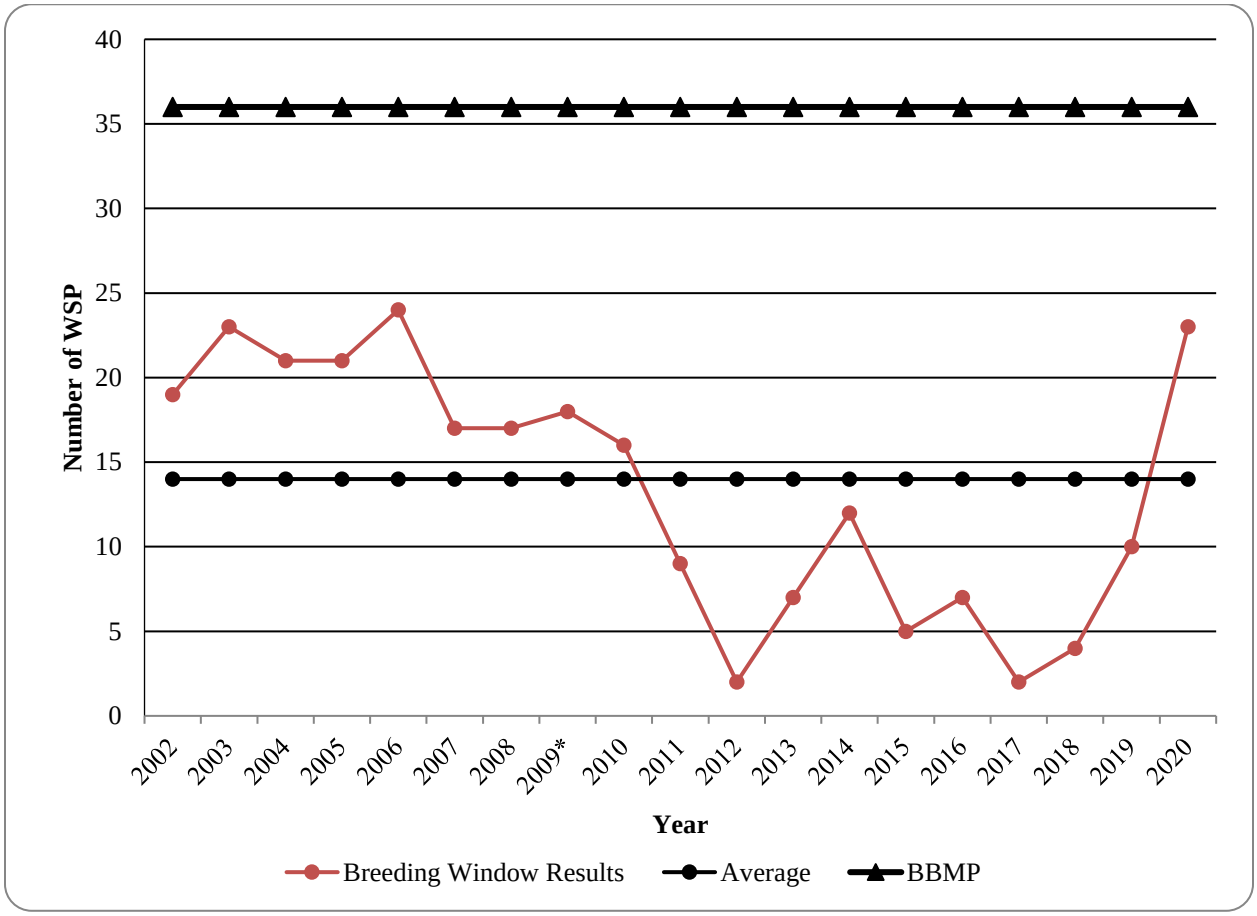
active nests plus males with chicks, the minimum breeding adult numbers at Villa Creek Beach is seven for 2020. During the range-wide breeding window survey eight adults were counted. Both numbers are well below the BBMP of 25.

Figure 2: Breeding Window Survey Results at Villa Creek Beach from 2002-2020.



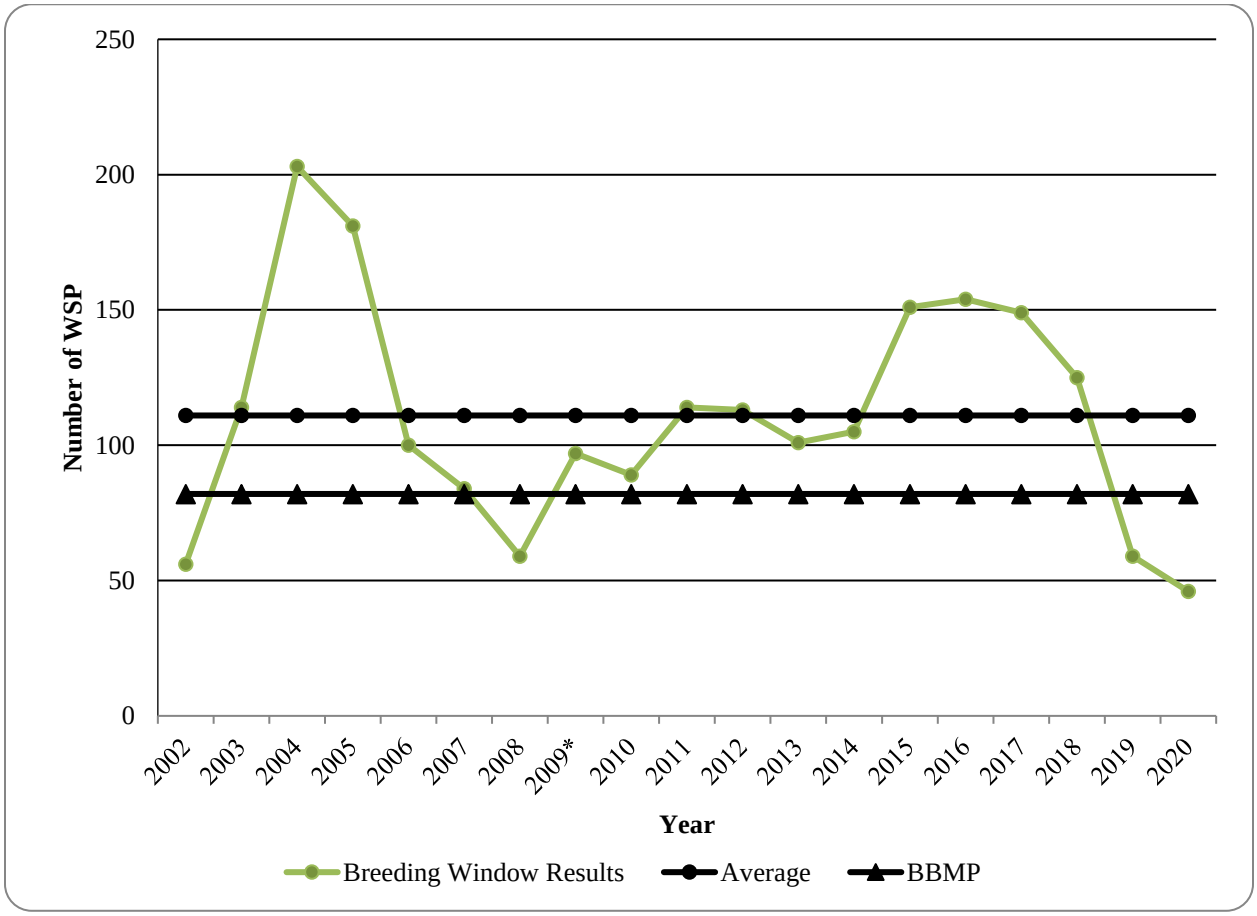
In the Recovery Plan, Atascadero Beach includes both CSP and City property with a BBMP of 40. Morro Strand comprises 90% of Atascadero Beach, which is 36 of the 40 BBMP. Morro Strand has seen a steep decline in breeding WSP since 2002, but this year's numbers were above average (Figure 3). Utilizing the maximum number of active nests plus males with chicks, the minimum number of breeding adults at Morro Strand was 18 for 2020. During the range-wide breeding window survey 23 adults were counted. This number is close to Morro Strand's peak in 2006 (with 24 breeding adults), but Morro Strand breeding adult numbers have never reached the BBMP of 36. It is unlikely that Morro Strand will ever reach its BBMP due to high use of the beach by the public.

Figure 3: Breeding Window Survey Results at Morro Strand from 2002-2020.



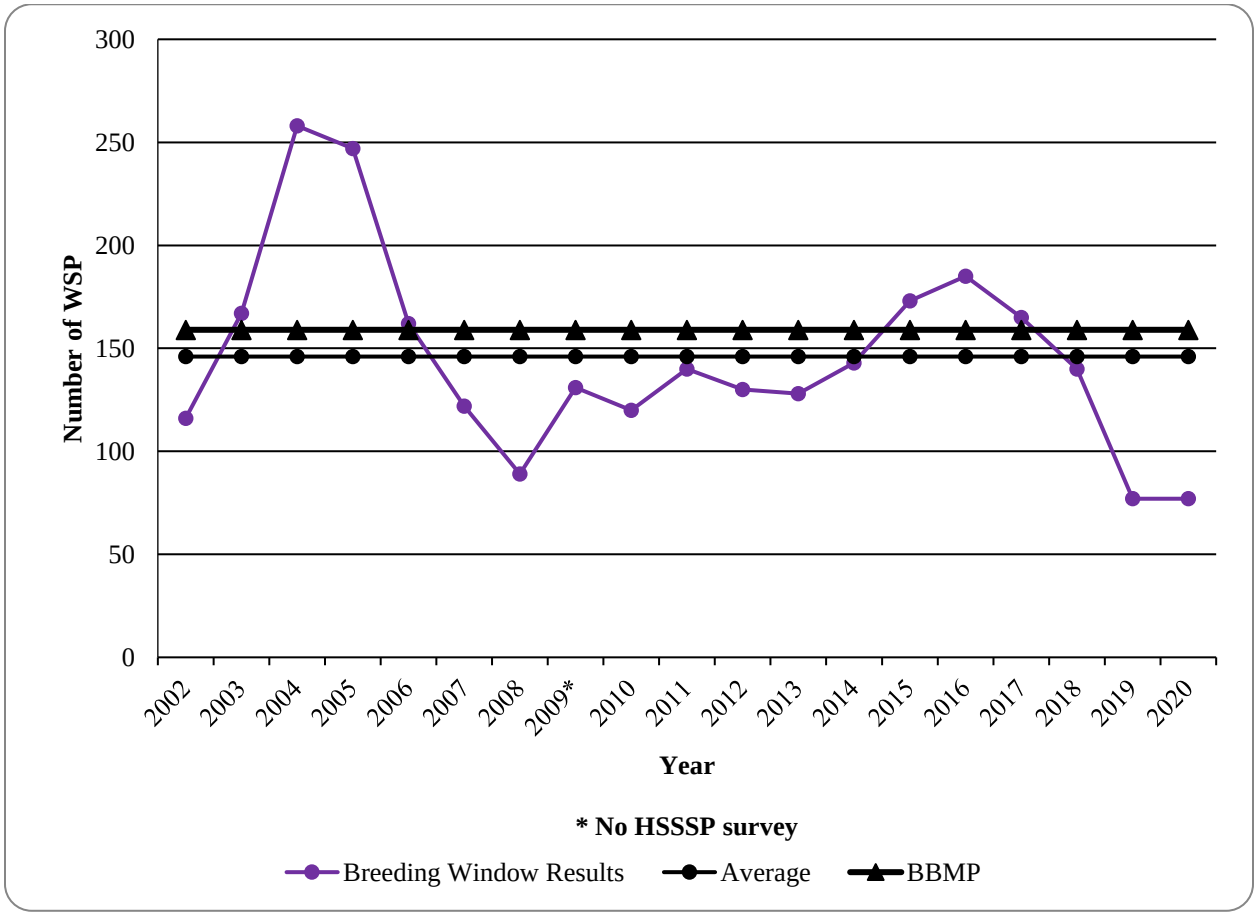
The Recovery Plan defines a BBMP of 110 individuals for the Sandspit when including both CSP and City property. The CSP portion comprises 75% of the Sandspit, which is 82 of the 110 BBMP. While the WSP population at the Sandspit had been gradually increasing since 2008, this year marked the third consecutive year showing a significant decline in the number of breeding adults utilizing this habitat (Figure 4). In 2020, the WSP breeding population at CSP Sandspit property reached an all-time low with only 46 adults observed during the annual range-wide breeding window survey. This observed population was far below the Sandspit's breeding window survey average of 111 adult WSP, which was calculated using data from 2002-2020. For just the second time since 2008, the Sandspit breeding adult numbers were recorded as less than the BBMP of 82, making 2020 just the fourth time that the BBMP was not met since consistent monitoring began in 2001. If 2020's maximum number of nesting pairs plus males with chicks calculation was used to determine this year's Sandspit WSP breeding numbers, the number of breeding adults at the Sandspit would have been recorded as even lower than the number of WSP observed at the Sandspit during the range-wide breeding window survey, with just 39 individuals confirmed to be concurrently nesting or brooding at this site during the peak of Sandspit nesting activity. The fact that this calculated WSP population is lower than the number of WSP observed at the Sandspit during the range-wide breeding window survey is likely due to the high level of nest depredation that was observed on the Sandspit this year, which resulted in an extremely high nest turnover rate.

Figure 4: Breeding Window Survey Results at the Sandspit from 2002-2020.



Cumulative breeding window survey results for all District beaches typically mirror the trends of the Sandspit, as this beach typically accounts for most of the breeding WSP in the District (Figure 5). This year's Districtwide breeding window survey results show that the breeding WSP population observed utilizing all District beaches remained low in 2020 when compared with data from previous years. For the second year in a row, only 77 adult WSP were observed in the District during this survey. This observed population is well below both the Districtwide breeding window survey average of 146 breeding adults, which was calculated using data from 2002-2020, as well as the District's cumulative BBMP of 159 individuals. If 2020's maximum number of nesting pairs plus males with chicks calculation was used to determine this year's WSP breeding numbers, the cumulative number of breeding adults in the District would have been recorded as even lower than the number of WSP observed during the breeding window survey, with just 56 individuals confirmed to be concurrently nesting or brooding at the peak of the breeding season. The fact that this calculated WSP population is lower than the number of WSP observed during the Districtwide breeding window survey is likely due to the high level of nest depredation that was observed at District beaches this year, which resulted in an extremely high nest turnover rate.

Figure 5: Cumulative Breeding Window Survey Results on District Beaches from 2002-2020.



Nest and Egg Numbers

There were 164 nests with a total of 376 eggs found at District beaches in 2020 (Table 6). The average clutch size was 2.3 with 51% of clutches having three eggs; 29% were two egg clutches; and 20% were one egg clutches. A summary of nest and egg numbers by beach can be found in Table 7.

Table 6: Number of Nests Found by Year at District Beaches 2009-2020.

Location	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
HSSSP	2	0	0	3	0	0	1	1	2	1	0	0
Villa Creek Beach	38	26	21	31	20	23	24	10	14	21	18	14
Morro Strand	26	24	25	12	12	17	13	16	16	12	18	44
Sandspit	144	179	213	174	157	201	272	238	226	169	136	106
Total	**210**	**229**	**259**	**220**	**189**	**241**	**310**	**265**	**258**	**203**	**172**	**164**

Table 7: Number of Breeding Adults, Nests, Eggs, and Fledglings on District Beaches in 2020.

Location	Breeding Adults*	Nests	Eggs	# of Eggs Hatched	Fledglings
HSSSP	0	0	0	0	0
Villa Creek Beach	8	14	30	13	6
Morro Strand	23	44	107	0	0
Sandspit	46	106	239	49	9
District	77	164	376	62	15

*Based on results of range-wide breeding window survey

Appendix 10 depicts the number of nests found by month at all District beaches from 2004 through 2020. In 2020, the month with the greatest number of nests found was June (45), followed by April (44), May (37), July (26), March (11), and August (1).

Tables in Appendix 10a provide a summary of first nest initiation and last hatch dates for all District beaches from 2002 through 2020. As WSP nests are found at different stages with anywhere from one to three eggs already laid, each nest's initiation date is approximated using a model of typical WSP nest progression and any available data on that particular nest. The District's first WSP nest in 2020 was initiated at the Sandspit on approximately March 18th. This nest was found with three eggs on March 20th and was given an EHD of April 18th based on float data. The last hatch of the year occurred on August 10th when two young chicks were observed near an empty nest bowl at Villa Creek Beach on their predicted hatch date. The last chick of the year was seen at the Sandspit on September 1st. Based on these dates, the length of the WSP breeding period in the District this year, as calculated from the estimated initiation date of the first nest to the last known chick sighting, was 167 days.

Appendix 10b includes graphic representations of the total number of nests that were known to be active at some point during each week (Saturday-Friday) of the breeding period at District beaches. The first week of the breeding period was the week ending March 20th when three WSP nests were discovered at District beaches. The time period with the most WSP nesting activity in the District occurred the week ending July 10th with 31 individual nests that were active at some

point during the week. Single days with the most concurrently active WSP nests were June 8th, June 19th, and July 1st, when 25 nests were active at once. WSP nesting activity in the District dropped off significantly during the week ending July 24th, which had only 18 nests that were active at some point during the week. After this week, WSP nesting activity in the District continued to decline until the last known nest hatched during the week ending August 14th. During the peak active breeding period (May through July), the average number of nests that were active at some point during any given week was 25. During the time period ranging from the initiation of the first nest in the District to the hatching or failing of the last nest in the District, the average number of nests that were active at some point during any given week was 16.

A total of 140 nests failed at all District beaches in 2020. Appendix 10c depicts the timing of nest failures at District beaches during each week of the breeding season. Compared to other weeks of the breeding season, the highest rate of nest failure occurred during the week ending May 8th, when 14 nests were lost. The month of May had the highest weekly rate of nest failure with an average of nine nests failing per week. This was a total of 45 failed nests, 27 of which were depredated.

In addition to the 140 failed nests at District beaches in 2020, 24 nests hatched (for a hatch rate of 15%), and no nests had unknown fates. Appendix 10d shows nest fates for all District beaches from 2001 through 2020, while Appendix 10e provides a graph depicting the number of nests hatched each year from 2001 through 2020 at all District beaches. The average number of nests hatched for all beaches since 2001 is 101. Appendix 10f provides a graph depicting the number of nests hatched by month each year from 2005 through 2020 at all District beaches. July saw the highest number of hatches in 2020 with 11 nests hatching across the District. The average number of nests hatched per month in 2020 was five.

During the 2020 breeding season, dead WSP, abandoned, tide washed, dropped, or unhatched eggs were collected on District beaches for Santa Barbara Museum of Natural History (SBMNH) as authorized by USFWS (Appendix 11). A total of 32 eggs were collected during the 2020 breeding season. However, due to the COVID-19 pandemic and social distancing guidelines, embryonic development was not able to be analyzed this year.

Hearst San Simeon State Park

During the 2020 breeding season, the only breeding activity at any of the eight beaches comprising HSSSP occurred on San Carpoforo Creek Beach in early April. Though WSP were observed at all eight beaches on at least one occasion during the breeding season, the only breeding activity observed was two scrapes found at San Carpoforo Creek Beach. One of the paired birds was Rw:br, banded as an adult at Zmudowski SB in 2009 and has been observed as paired at San Carpoforo Creek Beach every year since 2011 except during the 2016 breeding season. Rw:br nested successfully at San Carpoforo Beach Creek in 2012, 2015, and 2017.

Villa Creek Beach

A total of 14 nests were found at Villa Creek Beach during the 2020 breeding season (Table 8). The month of May was the most prolific in terms of newly found nests (6). The first nest was discovered on March 27th, and the last nest was found on July 13th at three eggs with an

estimated initiation date of July 10th. The first nest hatched on May 14th, and the last nest hatched on August 10th. The dates with the highest number of concurrently active nests at this site were May 27th through June 1st and June 5th through June 24th, with three nests active at once.

Table 8: Number of Nests Found by Month at Villa Creek Beach 2005-2020.

Month	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
March	2	2	3	2	7	0	0	0	0	2	2	0	0	0	3	1
April	14	10	7	4	13	5	7	5	4	6	6	4	3	6	4	3
May	9	15	12	3	8	7	6	10	5	9	11	4	4	6	3	6
June	12	8	5	5	7	13	4	10	5	4	5	1	4	6	6	2
July	0	3	3	2	3	1	4	6	6	2	0	1	3	3	2	2
August	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**37**	**38**	**30**	**16**	**38**	**26**	**21**	**31**	**20**	**23**	**24**	**10**	**14**	**21**	**18**	**14**

Fates were determined for all 14 nests (Table 9). A total of five nests hatched successfully (36%) and nine failed (64%). All nine failed nests were depredated. See the "Depredation" section for more information on nests lost to predators.

Table 9: Nest Fates and Percentages for Villa Creek Beach in 2020.

Total Nests	**14**	**% Total**	
Unknown Fate	0		
Total With Known Fate	14	100%	
Hatch	**5**	36%	
Fail	**9**	64%	**% Failed Nests**
Depredated	9	64%	100%
Abandoned	0		
Tide	0		
Take	0		
Unknown Fail	0		

The 14 Villa Creek Beach nests in 2020 produced a total of 30 eggs: seven nests had a clutch size of three, three had a clutch size of two, and three had a clutch size of one. All six of the one and two egg clutches failed to predators before additional eggs could be laid. Out of the 30 total eggs, 13 eggs (43%) hatched. One dropped egg that was not attributed to a nest was also produced at Villa Creek Beach. This dropped egg was not included in the total egg numbers and was not collected.

Two unhatched eggs from one nest were collected at Villa Creek Beach in 2020. Collected eggs are usually analyzed to determine embryonic development at SBMNH after the breeding season ends (Appendix 11). However, due to the COVID-19 pandemic and social distancing guidelines, analysis to determine embryonic development at SBMNH was not able to be completed in 2020.

Table 10 shows the distribution of nests and their fates at Villa Creek Beach for the 2020 breeding season. The area with the most WSP nest locations was in the middle section of the main beach.

Table 10: Nest Distribution and Fate at Villa Creek Beach in 2020.

Area	# of Nests	% of Total Nests	Hatch	% of Known Fate Hatched Nests	Fail	% Known Fate of Failed Nests
Back Area[1]	1	8%	1	20%	0	
West of Villa Creek[2]	0		0		0	
Main Beach: North	4	28%	1	20%	3	22%
Main Beach: Middle	5	36%	1	20%	4	28%
Main Beach: South	4	28%	2	40%	2	40%
Pocket Beaches	0		0		0	
Total	**14**	**100%**	**5**	**100%**	**9**	**100%**

1. Area formerly known as "South of Villa Creek"
2. Area formerly known as "North of Villa Creek"

Table 11 shows a summary of WSP nest distribution across beach segments from 2001 through 2020. Since 2001, the majority of WSP nests have been located at the main beach, where nest numbers have ranged from nine nests in 2016 to 56 in 2004. In 2020, the majority of the nests (93%) were located at the main beach. See Appendix 1 for a map with area distinctions and Appendix 12 for nest locations.

Table 11: Distribution of Nests at EBSP 2001-2020

Year	West of Villa Creek[1]	Back Area[2]	Main Beach	Pocket Beaches	Cayucos Point [3]	Total
2020	**0**	**1**	**13**	**0**	**0**	**14**
2019	0	1	17	0	0	**18**
2018	0	1	20	0	0	**21**
2017	1	2	11	0	0	**14**
2016	0	1	9	0	0	**10**
2015	1	0	23	0	0	**24**
2014	2	0	20	0	0	**22**
2013	0	0	18	2	0	**20**
2012	0	0	30	1	0	**31**
2011	0	1	20	0	0	**21**
2010	0	0	24	2	0	**26**
2009	0	0	37	1	0	**38**
2008	0	0	15	1	0	**16**
2007	0	0	29	0	1	**30**
2006	0	0	34	3	1	**38**
2005	1	0	32	3	1	**37**
2004	3	2	56	3	2	**66**
2003	0	1	31	2	1	**35**
2002	2	5	33	4	0	**44**
2001	1	5	28	5	0	**39**

1. Area formerly known as "South of Villa Creek"
2. Area formerly known as "North of Villa Creek"
3. Area formerly known as "Estero Bluffs"

Morro Strand

A total of 44 nests were found at Morro Strand during the 2020 breeding season (Table 12). The month of May had the most initiated nests with 12 nests. The first nest was initiated on March 27th, and the last nest was found on July 20th. Despite there being a higher than average number of nests, there were zero hatches at Morro Strand during the 2020 breeding season. The date with the highest number of concurrently active nests at this site was June 8th with nine nests active at once.

Table 12: Number of Nests Found by Month on Morro Strand 2005-2020.

Month	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
March	0	0	0	1	2	0	2	0	0	3	0	0	2	0	0	2
April	3	7	6	14	7	6	7	6	5	8	8	4	6	2	3	10
May	10	9	5	7	8	8	4	2	2	4	0	8	1	2	6	11
June	9	11	7	8	8	9	10	3	2	1	2	3	6	2	6	10
July	5	7	1	3	1	1	2	1	2	1	3	1	1	6	3	11
August	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Total	**27**	**34**	**19**	**33**	**26**	**24**	**25**	**12**	**12**	**17**	**13**	**16**	**16**	**12**	**18**	**44**

Fates were determined for all 44 nests (Table 13). Zero nests hatched successfully, with all 44 nests failing. This rate of nest failure has not been observed at Morro Strand nor any other monitored beaches in the District. Of the nests that failed at Morro Strand, 40 nests were depredated, two were abandoned, and two were lost due to wind. See the "Depredation" section for information on nests lost to predators.

Table 13: Nest Fates and Percentages for Morro Strand in 2020.

Total Nests	**44**	**% Total**	
Unknown Fate	0	0%	
Total With Known Fate	44	100%	
Hatch	**0**		
Fail	**44**	**100%**	**% Failed Nests**
Depredated	40	**91%**	91%
Abandoned	2	**4.5%**	4.5%
Wind	2	**4.5%**	4.5%

The 44 Morro Strand nests in 2020 produced a total of 107 eggs. Twenty-four nests had a clutch size of three, 15 had a clutch size of two, and five had a clutch size of one. Two dropped eggs that were never attributed to nests were also produced at Morro Strand. These dropped eggs were not included in the total egg numbers. Ten out of the 15 two egg clutches failed to predators before a third egg could be laid. One of the one egg clutches failed to an avian predator before additional eggs could be laid. Out of the 107 total eggs, none (0) hatched.

Six eggs were collected at Morro Strand in 2020. Collected eggs are usually analyzed to determine embryonic development at SBMNH after the breeding season ends (Appendix 11).

However, due to the COVID-19 pandemic and social distancing guidelines, analysis to determine embryonic development at SBMNH was not able to be completed in 2020. The source of four of these collected eggs were from two nests that were abandoned and one nest that failed to wind. The other two collected eggs were dropped eggs that were not associated with nests.

The distribution of nests and their fates within each beach segment in 2020 is shown in Table 14. The section with the highest number of nests (25 of the 44 known nests) was between Azure and Boardwalk Corridors.

Table 14: Nest Distribution and Fate at Morro Strand in 2020**.**

Area	# of Nests	% of Total Nests	Hatch	% of Known Fate Hatched Nests	Fail	% of Known Fate Failed Nests
Campground -Hatteras	11	25%	0		11	25%
Hatteras-Azure	2	5%	0		2	5%
Azure-Boardwalk	25	57%	0		25	57%
Boardwalk-Hwy 41	6	13%	0		6	13%
Total	**44**	**100%**	**0**	**100%**	**44**	**100%**

WSP nest distribution among Morro Strand beach segments from 1993 through 2020 is shown in Table 15. The number of WSP nests in 2020 (44) was the highest it has been since 1997 (50 nests). The distribution of nests was consistent with previous years where the most nests occurred between the Azure and Boardwalk Corridors. For the first time since 2010, WSP nested in front of the Morro Strand Campground (11 nests) and symbolic fencing was once again installed in that area. It is possible that nesting occurred in front of the campground again due to the COVID-19 closure of the campground for most of the breeding season. The beach was still open for day use and heavily used by visitors.

Table 15: Distribution of Nests at Morro Strand 1993-2020.

Year	Campground-Hatteras[1]	Hatteras-Azure[2]	Azure- Boardwalk[3]	Boardwalk-Hwy 41[4]	Total
2020	**11**	**2**	**25**	**6**	**44**
2019	0	0	13	5	**18**
2018	0	2	8	2	**12**
2017	0	4	9	3	**16**
2016	0	1	15	0	**16**
2015	0	2	11	0	**13**
2014	0	1	14	2	**17**
2013	0	1	9	2	**12**
2012	0	2	7	3	**12**
2011	0	6	13	6	**25**
2010	2	1	16	5	**24**
2009	7	5	10	4	**26**
2008	12	4	15	2	**33**
2007	5	2	11	1	**19**
2006	1	5	21	7	**34**
2005	4	5	15	3	**27**
2004	3	10	20	5	**38**
2003	4	8	24	4	**40**
2002	0	0	27	10	**37**
2001	0	0	11	2	**13**
2000	0	0	9	0	**9**
1999	0	0	18	0	**18**
1998	0	0	18	2	**20**
1997	0	10	25	15	**50**
1996	0	4	30	13	**47**
1995	N/A	N/A	N/A	N/A	**N/A**
1994	2	13	23	8	**46**
1993	0	3	5	6	**14**

See Appendix 1 for a map with area distinctions and Appendix 12 for nest locations.

Sandspit

A total of 106 nests were found at the Sandspit this year (Table 16). A total of 34 nests were initiated in the month of June, comprising 32% of the season total at this site. A total of 50 nests were found on the northern half of the Sandspit, while 56 nests were found on the southern half. The first nest was estimated to have been initiated on March 18th, as it was found at three eggs on March 20th and given an EHD of August 18th based on float data. The last nest was found on August 6th. The first hatch occurred on June 8th, and the last hatch occurred on August 7th. The dates with the highest number of concurrently active nests at this site were July 8th and 9th, with 18 nests active at once.

Table 3: Number of Nests Found by Month at the Sandspit 2005-2020**.**

Month	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
March	0	2	10	14	8	10	4	21	39	31	5	17	0	1	9
April	33	23	18	40	57	54	39	39	32	62	51	50	51	36	30
May	41	41	27	32	47	63	42	34	60	81	55	84	39	38	23
June	44	30	27	39	53	69	57	46	48	68	77	58	52	36	34
July	22	11	14	19	14	14	27	17	22	29	50	16	25	24	10
August	1	2	0	0	0	3	5	0	0	1	0	1	2	1	0
Total	**141**	**109**	**96**	**144**	**179**	**213**	**174**	**157**	**201**	**272**	**238**	**226**	**169**	**136**	**106**

A summary of nest fates for this season at the Sandspit can be found in Table 17. Nest fates were determined for all 106 nests this year. Eighty-seven nests failed (82%) and 19 nests hatched successfully (18%). Of the nests that failed, 70 were depredated, seven were washed over by tide, six were abandoned, three were lost to wind, and one failed to an unknown cause. See the "Depredation" section for information on nests lost to predators.

Table 4: Nest Fates and Percentages for the Sandspit in 2020.

Total Nests	**106**	**% Total**	
Total With Known Fate	106	100%	
Hatch	**19**	**18%**	
Fail	**87**	**82%**	**% Failed**
Depredated	70	66%	80.5%
Wind	3	2.8%	3.5%
Abandoned	6	5.7%	6.9%
Tide	7	6.6%	8%
Unknown fail	1	0.9%	1.1%

Of the 239 eggs produced at the Sandspit, a total of 49 hatched (21%). Fifty-two nests reached a clutch size of three, 29 nests reached a clutch size of two, and 25 nests only reached a clutch size of one. Three dropped eggs that were never attributed to nests were also produced on the Sandspit. These dropped eggs were not included in the total egg numbers. Twenty out of 29 two egg clutches failed to predators before a third egg could be laid. Nineteen out of 25 one egg clutches failed to predators before additional eggs could be laid.

Twenty-four unhatched, dropped, or otherwise abandoned eggs were collected for analysis at SBMNH to determine their stage of embryonic development (Appendix 11). However, due to the COVID-19 pandemic and social distancing guidelines, this analysis at SBMNH was not able to be completed this year. The source of 22 of these collected eggs were five nests that were abandoned, three nests that failed to wind, two nests that failed to tide, and three nests where

only two out of three eggs hatched. The other two collected eggs were dropped eggs that were not associated with nests.

There were four incidents of nests moving to new locations. In these instances, the final nest bowl sites were moved away from the original location by a range of approximately ten inches to 12 feet. Two of the nests were moved by tide during periods of high surf but continued to be attended to by WSP. Both nests that were moved by tide eventually failed. One of the nests moved shortly after the installation of a mini-exclosure. The exclosure was repositioned by monitors, and the nest eventually hatched. The fourth nest was perched atop a steep slope and had two of its eggs roll out of the nest bowl on the same day that the third egg in the clutch hatched (both of these displaced eggs were observed within new individual nest bowls). One of the displaced eggs hatched, while the other did not.

In 2020, the highest number of Sandspit nests occurred between RM5 and RM4 (27). This section also had the greatest number of hatches (5). The areas between RM5 to RM4, also had the highest number of failed nests (22). Distribution of nests and their fates within each beach segment in 2020 are shown in Table 18. The table also includes percentages of nests failed and hatched.

Table 5: Nest Distribution and Fate at the Sandspit in 2020.

Area	# of Nests	% of Total Nests	Hatch	% of Known Fate Hatched Nests	Fail	% of Known Fate Failed Nests
SPB-RM6	2	1.9%	0		2	2.3%
RM6-RM5	10	9.4%	1	5%	9	10.3%
RM5-RM4	27	25.5%	5	26%	22	25.3%
RM4-RM3	17	16%	4	21%	13	14.9%
RM3-RM2	18	17%	4	21%	14	16.1%
RM2-RM1	12	11.3%	3	16%	9	10.3%
RM1-SST	10	9.4%	2	11%	8	9.2%
SST-HAZ	10	9.4%	0		10	11.5%
SOUTH HAZ	0		0		0	
Total	**106**	**100%**	**19**	**100%**	**87**	**100%**

WSP nest distribution among beach segments from 2000 through 2020 is shown in Table 19. The distribution of nests in 2020 was consistent with previous years in that most nests occurred between RM5 and RM4. Prior to 2019, the State Park Boundary (SPB) to RM6 and RM6 to RM5 sections had much higher nest numbers. The reduction of nest numbers in these sections may be due to a narrower beach and reduced breeding habitat. Nest numbers between the SPB and RM6 are an estimate for the years 2000 to 2004 due to a lack of demarcation of the CSP property line. Additionally, monitoring for nests was not conducted at the beach south of the Sandspit Trail until 2004. Two small areas south of the Sandspit Trail were temporarily fenced in April due to WSP scrapes being found outside the symbolic fencing, but no nests were found.

Table 6: Distribution of Nests on the Sandspit 2000-2020.

Year	SPB-RM6	RM6-RM5	RM5-RM4	RM4-RM3	RM3-RM2	RM2-RM1	RM1-SST	SST-HAZ	SOUTH HAZ	Total
2020	2	10	27	17	18	12	10	10	0	**106**
2019	3	9	25	19	21	22	24	12	1	**136**
2018	12	21	32	27	20	28	19	9	1	**169**
2017	17	45	46	37	18	28	20	12	3	**226**
2016	16	36	59	40	27	25	21	10	4	**238**
2015	23	29	55	44	34	39	30	13	5	**272**
2014	21	23	35	30	24	31	22	10	5	**201**
2013	21	24	29	19	19	30	12	3	0	**157**
2012	21	25	40	19	14	21	17	9	0	**166**
2011	37	37	42	29	28	24	12	4	0	**213**
2010	20	35	29	31	26	22	14	2	0	**179**
2009	18	27	24	30	12	22	8	3	0	**144**
2008	10	19	20	16	13	10	2	6	0	**96**
2007	12	21	19	23	12	12	7	3	0	**109**
2006	12	24	26	33	15	21	7	3	0	**141**
2005	12	39	48	39	27	30	18	12	0	**225**
2004	41	55	50	47	29	34	12	4	0	**272**
2003	23	26	32	26	17	17	5	N/A	N/A	**146**
2002	24	16	30	16	7	7	7	N/A	N/A	**107**
2001	29	24	24	8	5	4	6	N/A	N/A	**100**
2000	19	18	25	19	11	5	2	N/A	N/A	**99**

See Appendix 1 for a map with area distinctions and Appendix 12 for nest locations.

According to the USFWS WSP Recovery Plan, WSP incubation periods begin after the last egg in the clutch is laid. The expected incubation period for a WSP nest is between 26 and 31 days, with a mean of 27 days. In 2020, there were seven Sandspit nests with verifiable incubation periods. All seven of the nests hatched within the expected range. The range of verified incubation periods for successfully hatching nests was between 26 and 28 days. Table 20 provides a summary of incubation duration data for successful nests with known clutch initiation dates at the Sandpit in 2020.

Table 7: Number of Nests Hatched by Days Incubated at the Sandspit in 2020.

	Early			Average					Late	
Days Incubated	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**
# of Nests Hatched	0	0	2	2	3	0	0	0	0	0
			Expected Range							

Floated Eggs

Nests discovered at their completed clutch size, with no discernable initiation date, were floated to provide an EHD. In 2020, 14 nests were floated to determine an EHD. See Appendix 8 for float data.

Villa Creek Beach

This season, four nests were found at three eggs at Villa Creek Beach. Due to high depredation rates, none of the four nests were floated to determine an EHD. Of the four nests found at three eggs, three hatched, and one failed to a coyote (*Canis latrans*).

Morro Strand

Due to the high prevalence of depredations, nests typically are not floated at Morro Strand unless an exclosure is also being erected around the nest. In 2020, 11 nests were found at three eggs and two nests were floated to determine an EHD. Of the 11 nests found at three eggs, four failed to striped skunk (*Mephitis mephitis*), three failed to unknown predators, two failed to American crow (*Corvus brachyrhynchos*), one failed to a red fox (*Vulpes vulpes*), and one failed to an unknown avian predator. Both nests that were floated and placed inside an exclosure failed to striped skunk 2 and 11 days after being floated.

Sandspit

This season, 23 nests were found at three eggs at the Sandspit. Eleven of these nests were floated to determine an EHD, while 12 of these nests were never floated. Of the 12 nests that were never floated, three hatched and nine failed. Of these failed nests, two were depredated by coyote, two were depredated by unknown predators, two were depredated by unknown corvid, one was depredated by Common raven (*Corvus corax*), one was depredated by American crow, and one failed due to tide. Of the 11 three egg nests that were floated, seven hatched and four failed. All seven of the hatched nests were placed inside mini-exclosures after being floated. Of these four failed nests, two were depredated by unknown corvid within a range of 15 to 20 days after being floated, one failed to abandonment 18 days after being floated, and one failed to wind seven days after being floated. The nests that failed to abandonment and wind were inside mini-exclosures. A WSP wing was found 15 feet from the nest that was abandoned.

This season, 15 nests at the Sandspit were found at two eggs with a third egg never being produced. One of these nests was floated and placed inside a mini-exclosure and subsequently hatched six days later, while the other nests were never floated. Of these unfloated nests, ten were depredated before a third egg could be laid; one hatched 13 days after its discovery; one was depredated by an unknown corvid six days after its discovery; one failed to tide four days after its discovery; and one nest was completely buried two days after its discovery.

In total, of the 35 eggs floated at the Sandspit this season, 20 of these eggs hatched (57%) from eight successful nests.

Chick/Fledgling Fate

Banding of chicks is not performed at any of the District beaches. Without a means of identifying individuals, a detailed quantitative assessment of chick and fledgling success could not be completed. Nonetheless, chicks and fledglings were observed on many occasions throughout the season as part of routine beach monitoring procedures and were documented on census counts. In 2020, a greater effort was undertaken to track chicks and fledglings. The first nest hatched in the District was at Villa Creek Beach on May 14th, and the first chicks to fledge were observed on June 11th - from that same nest on Villa Creek Beach. The last chick observed in the District was on September 1st on the Sandspit making the length of the breeding period for the District 167 days. The length of the breeding period was calculated from the date of the first nest initiation to the date of the last known chick observed.

Villa Creek Beach

Thirteen chicks hatched from five successful nests at Villa Creek Beach in 2020. The first chicks to be seen at Villa Creek Beach were observed on May 14th, and six fledglings were observed from four broods in the 2020 breeding season. The highest number of chicks observed on one day at Villa Creek Beach was seven from three broods. Six confirmed fledglings were observed at Villa Creek Beach. Being a relatively small beach, it is fairly certain there were no other fledglings. The fledgling success (number of fledglings divided by the number of chicks hatched) was 46%. The number of chicks fledged per male was 1.2. This was based on the five adult breeding males calculated from the number of most active nests plus the concurrent number of males with chicks. The last chick was seen August 10th making the length of the breeding period at Villa Creek Beach 136 days. The last chick was not known to fledge.

Morro Strand

There were zero successful nests at Morro Strand in 2020 and thus, no chicks. The first nest was found on March 27th, and the last day a nest was observed was July 25th making the length of the breeding period at Morro Strand 120 days.

The first dispersed juvenile known to reach Morro Strand from another beach arrived on June 27th. This juvenile, banded bb:ag, fledged from Oceano Dunes State Vehicular Recreation Area (ODSVRA).

Sandspit

Forty-nine chicks hatched from the 19 successful nests at the Sandspit in 2020. Broods containing chicks of varying ages were observed at the Sandspit throughout the season, with the first brood being observed on June 8th, the date of the first hatched nest, through September 1st, the date the last chick was observed. The highest number of chicks observed during one day at the Sandspit occurred on August 7th with seven chicks observed in four distinct broods.

Nine WSP were confirmed to have fledged from the Sandspit in 2020. The first fledglings were observed on July 6th. The highest number of fledglings observed on a single day occurred on September 1st when three fledged chicks were observed at the Sandspit. Confirmation of fledglings at the Sandspit was made difficult by the absence of individual bird identification and a high density of broods during certain time periods. As these factors made it difficult to link

specific fledglings to specific nests, it is likely that more juveniles fledged from the Sandspit than monitors were able to confirm. The minimum number of chicks fledged per male was 0.41. This was based on the 22 adult breeding males calculated from the highest number of active nests plus concurrent number of males with chicks. The last chick was observed on September 1st making this year's breeding period at the Sandspit 167 days. This chick was predicted to fledge on September 3rd.

The first dispersed juvenile known to reach the Sandspit from another beach arrived on July 14th. This juvenile, banded bb:wg, fledged from ODSVRA.

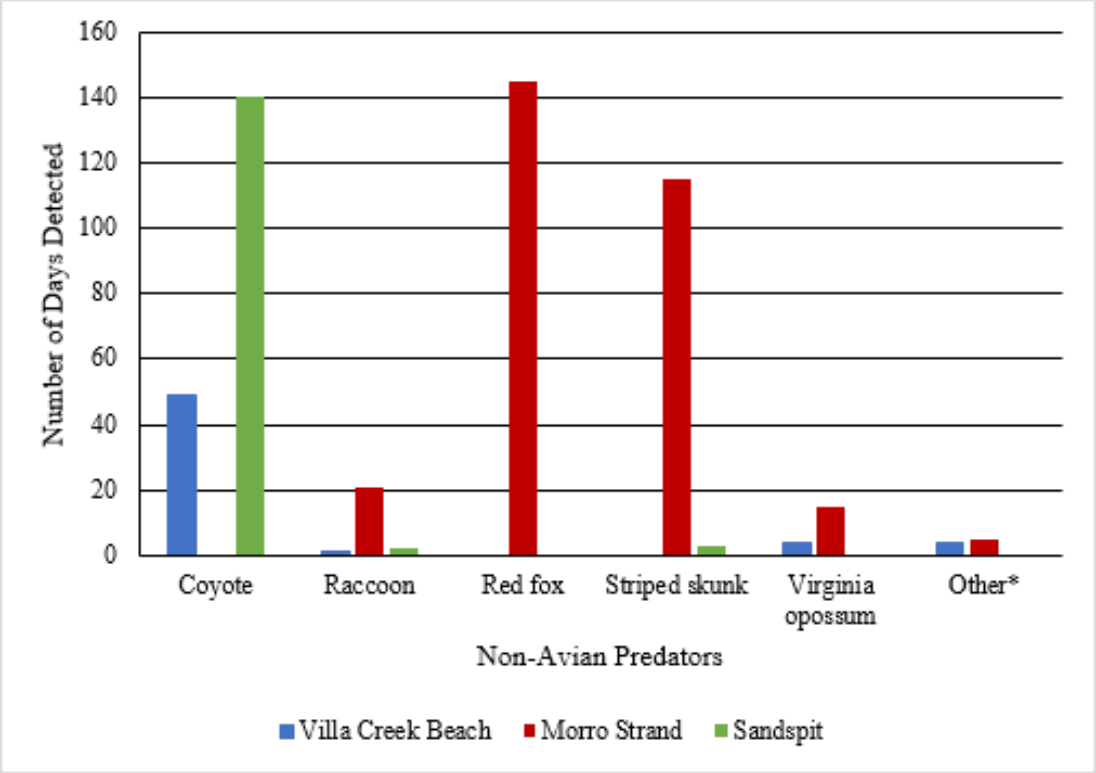
Predators

A summary of WSP nest depredation carried out by avian and non-avian predator species at District beaches from 2001 through 2020 can be found in Appendix 13.

Predator Presence across District Beaches

District beaches were monitored for WSP predators and WSP nest predators throughout the breeding season. Observations of live predators, predator tracks, and predator signs were documented by monitors in a daily log of predator detections. As common weather conditions such as fog and low winds often allowed existing tracks to remain at District beaches for extended periods of time, and as new tracks were identified by overlay, it was frequently difficult to discern between new and old tracks in certain settings. This difficulty in discerning between new and old predator tracks may have led to the non-documentation of new tracks in some instances in which they were mistaken for old tracks. This could have resulted in the presence of certain predators being under represented in daily monitoring logs. Figure 6 provides a graphical representation of the number of days that various non-avian predator species were detected by observation, tracks, or signs across District beaches in 2020, with the exclusion of HSSSP.

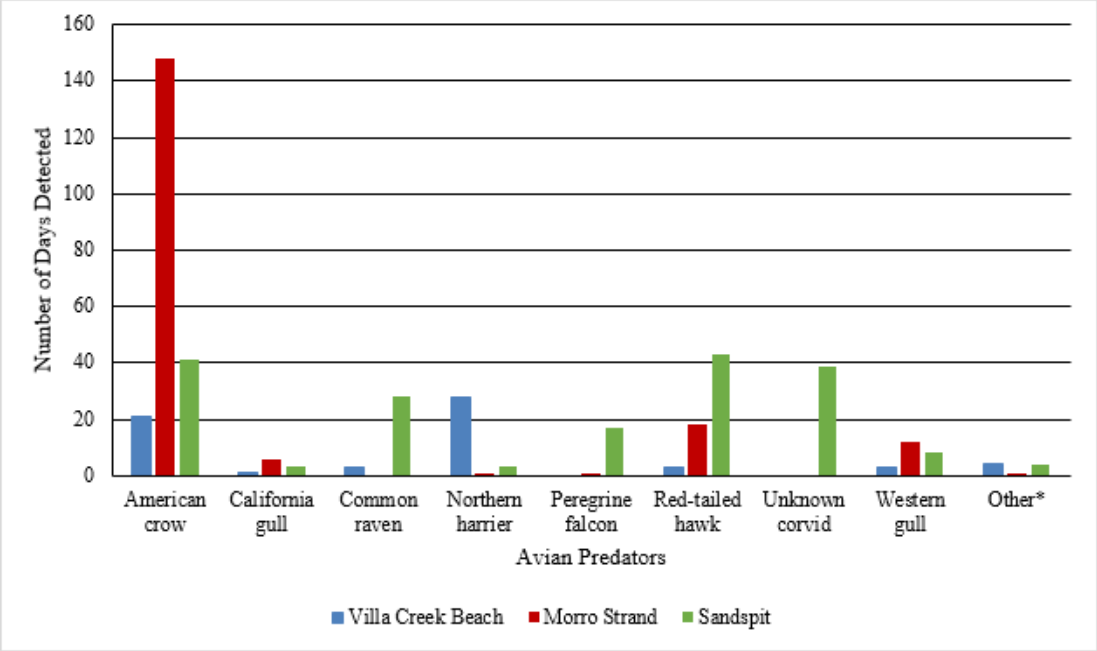
Figure 6: Number of Days Non-Avian Predators Detected Across District Beaches in 2020.



*Other: domestic cat, feral pig, long-tailed weasel

Gull species were only documented in predator monitoring logs when they were observed foraging near or in WSP nesting habitat. Figure 7 provides a graphical representation of the number of days that various avian predator species were detected by observation, tracks, or signs across District beaches in 2020, with the exclusion of HSSSP.

Figure 7: Number of Days Avian Predators Detected Across District Beaches in 2020.



*Other: American kestrel, Cooper's hawk, Great horned owl, Gull sp., Red-shouldered hawk, White-tailed kite

Hearst San Simeon State Park

HSSSP's high level of habitat variation and its distance from major urban areas contribute to it having a high level of predator diversity. Based on the available documentation of live observations, tracks, and signs, the most prevalent non-avian predator species at HSSSP was coyote, which was detected on 12 of the 51 days that predator monitoring occurred at this site. The other non-avian predator species documented at HSSSP this year, which included raccoon (*Procyon lotor*), striped skunk, and feral pig (*Sus scrofa*), were all detected on less than four monitoring days each.

The most prevalent avian predator species documented at HSSSP this year was American crow, which was detected on 30 of the 51 days that predator monitoring occurred at this site. The second most prevalent avian predator species was Common raven, which was detected on nine monitoring days. The other avian predator species documented at HSSSP this year included American kestrel (*Falco sparverius*), California gull (*Larus californicus*), Loggerhead shrike (*Lanius ludovicianus)*, Northern harrier (*Circus hudsonius*), Peregrine falcon (*Falco peregrinus*), Red-shouldered hawk (*Buteo lineatus*), Red-tailed hawk (*Buteo jamaicensis*), Western gull (*Larus occidentalis*), and White-tailed kite (*Elanus leucurus*). These species were detected on six or less monitoring days each. As predator monitoring at HSSSP was conducted less often than at other locations in the District, and as there were no documented WSP nests within the park's boundaries in 2020, predator detection data from HSSSP beaches were excluded from further analysis.

Villa Creek Beach

Nine out of the 14 total WSP nests found at Villa Creek Beach this year failed due to depredation. This nest depredation rate of 64% is the fourth highest ever recorded at Villa Creek Beach and is the highest depredation rate that has been recorded at this site since 2013. Of these nine depredated nests, five were depredated by unknown avian predators, one was depredated by coyote, one was depredated by American crow, one was depredated by unknown corvid, and one was depredated by an unknown predator. The majority of the substrate within the WSP nesting habitat at Villa Creek Beach does not allow for easily distinguishable tracks, which often complicates predator monitoring efforts and leads to a relatively high proportion of WSP nest depredations as being classified as carried out by some form of "unknown" predator species. A summary of nest depredations and the locations in which they occurred at this site can be found in Table 21 and Table 22.

Table 8: Nest Depredations by Predator on Villa Creek Beach in 2020.

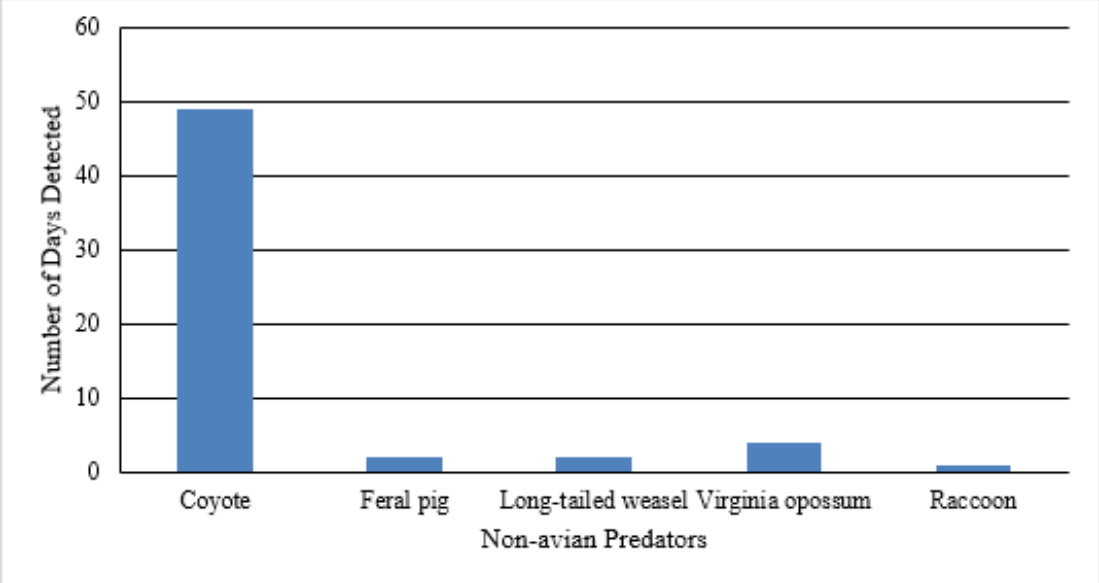
Total Nests	**14**		
Depredated Nests	**9**	**% Depredated Nests**	**% of Total Nests**
Unknown Avian	5	56%	36%
Coyote	1	11%	7%
American Crow	1	11%	7%
Unknown Corvid	1	11%	7%
Unknown Predator	1	11%	7%

Table 9: Distribution of Nest Depredations by Predator at Villa Creek Beach in 2020.

	Predators						
Area	**Unknown Avian**	**Coyote**	**American Crow**	**Unknown Corvid**	**Unknown Predator**	**Total Depredated**	**Total Nests**
Back Area	0	0	0	0	0	0	1
West of Villa Creek	0	0	0	0	0	0	0
Main Beach: North	2	1	0	0	0	3	3
Main Beach: Middle	3	0	0	0	1	4	3
Main Beach: South	0	0	1	1	0	2	7
Pocket Beaches	0	0	0	0	0	0	0
Total	**5**	**1**	**1**	**1**	**1**	**9**	**14**

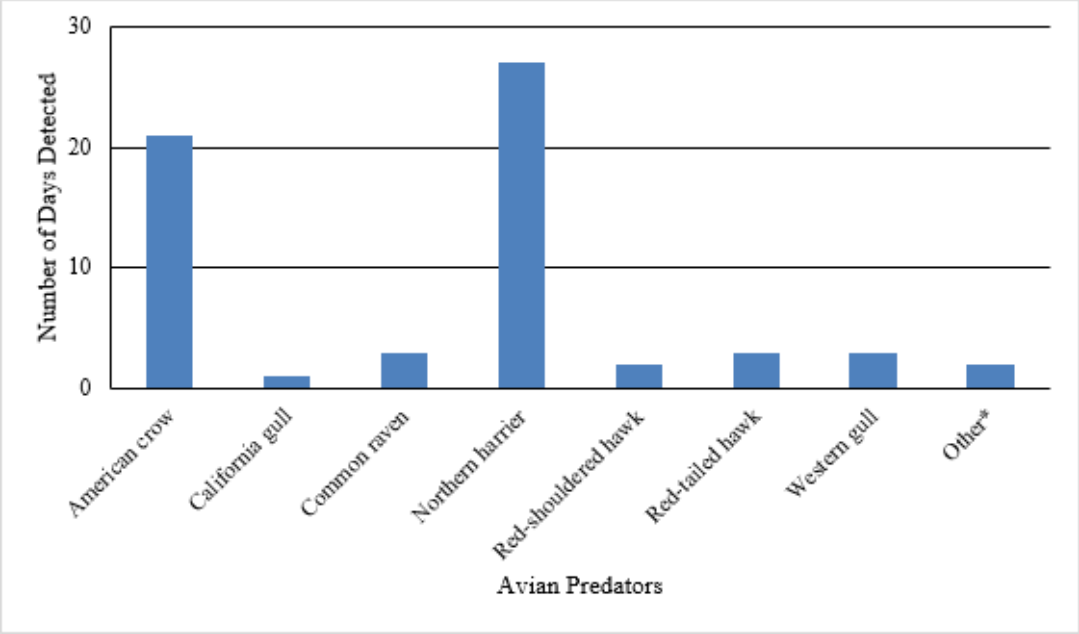
Based on the documentation of live observations, tracks, and signs, the most prevalent non-avian predator species at Villa Creek Beach this year was coyote, which was detected on 49 of the 112 days that predator monitoring occurred at this site. The other non-avian predator species documented at Villa Creek Beach this year, which included feral pig, long-tailed weasel (*Mustela frenata*), raccoon, and Virginia opossum *(Didelphis virginiana*), were detected on less than five monitoring days each. Figure 8 provides a graphical representation of the number of days that each non-avian predator species was detected at Villa Creek Beach in 2020.

Figure 8: Number of Days Non-Avian Predators Detected at Villa Creek Beach in 2020.



Based on the documentation of live observations, tracks, and signs, the most prevalent avian predator species at Villa Creek Beach this year was Northern harrier, which was detected on 27 of the 112 days that predator monitoring occurred at this site. The second most prevalent avian predator species at this site was American crow, which was detected on 22 monitoring days. The other avian predator species documented at Villa Creek Beach this year, which included Common raven, California gull, Cooper's hawk (*Accipiter cooperii*), Red-shouldered hawk, Red-tailed hawk, Western gull, and White-tailed kite were detected on less than five monitoring days each. Figure 9 provides a graphical representation of the number of days that each avian predator species was detected on Villa Creek Beach in 2020.

Figure 9: Number of Days Avian Predators Detected at Villa Creek Beach in 2020.



*Other: Cooper's hawk, White-tailed kite

Morro Strand

WSP at Morro Strand experienced record level nest depredation in 2020 with 40 out of 44 nests failing due to depredation. These 40 nests represent the highest total number of nests ever confirmed to have been depredated at Morro Strand in a single season, and this 91% depredation rate is the highest depredation rate ever recorded in the District outside of HSSSP. Out of the 40 depredated nests, 13 were depredated by striped skunk; 12 were depredated by unknown predators; seven were depredated by American crow; five were depredated by red fox; and three were depredated by unknown avian predators. Nest depredations by striped skunk at Morro Strand in 2020 was the highest it has ever been. In comparison to the 13 nests depredated by striped skunk in 2020, striped skunk were responsible for depredating only two nests at Morro Strand per year in 2016 through 2019. Prior to 2015, no striped skunk depredations occurred. A summary of all documented nest depredations and the locations in which they occurred at this site can be found in Table 23 and Table 24.

Table 10: Nest Depredations by Predator at Morro Strand in 2020.

Total Nests	**44**		
Depredated Nests	**40**	**% Depredated Nests**	**% of Total Nests**
Striped Skunk	13	33%	30%
Unknown Predator	12	30%	27%
American Crow	7	17%	16%
Red Fox	5	12%	11%
Unknown Avian	3	8%	7%

Table 11: Distribution of Nest Depredations by Predator at Morro Strand in 2020.

	Predators						
Area	**Striped Skunk**	**Unknown Predator**	**American Crow**	**Red Fox**	**Unknown Avian**	**Total Depredated**	**Total Nests**
Campground-Hatteras	5	6	0	0	0	11	11
Hatteras- Azure	0	0	1	0	1	2	2
Azure-Boardwalk	7	6	3	5	1	22	25
Boardwalk-Hwy 41	1	0	3	0	1	5	6
Total	**13**	**12**	**7**	**5**	**3**	**40**	**44**

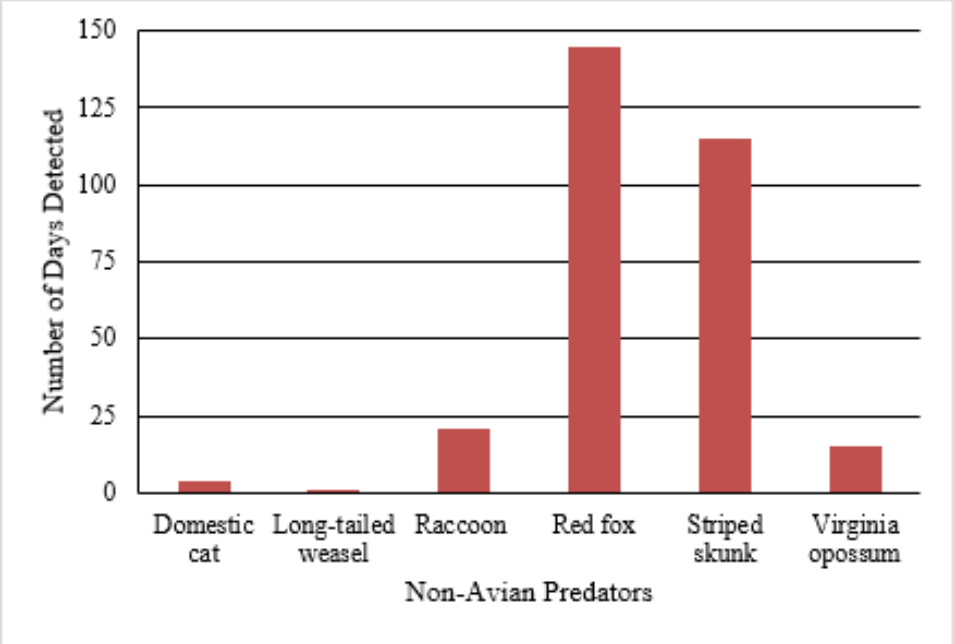
Exclosures were utilized at Morro Strand this year for the first time since 2017 in response to the extremely high rate of nest depredation. A total of ten nests were exclosed with mini-exclosures during the 2020 breeding season on Morro Strand, all of which failed despite the presence of the exclosures. Seven of the exclosed nests were depredated by striped skunk, two were depredated by unknown predators, and one was abandoned. The substrate in front of Morro Strand Campground, where the two unknown predator depredations of exclosed nests occurred, is highly compacted and does not register animal tracks. However, it is highly likely that striped skunk or long-tailed weasel were responsible for these depredations, as they are the only well-documented nest predators present at Morro Strand capable of entering the exclosures. Eight out of the ten mini-exclosures were installed in mid-June. Most of these nests were depredated by the end of June, so exclosure use was suspended for the remainder of the season. A summary of exclosed nest locations and fates at Morro Strand can be found in Table 25 and Appendix 14.

Table 12: Distribution of Exclosed Nests and Their Fates at Morro Strand in 2020.

Area	# of Exclosures Installed	Depredated	Abandoned	Total Exclosed Nest Fails	% Exclosed Nest Fails	Total Exclosed Nest Hatches	% Exclosed Nest Hatches
Campground-Hatteras	5	5	0	5	50%	0	
Hatteras-Azure	0	0	0	0		0	
Azure-Boardwalk	5	4	1	5	50%	0	
Boardwalk-Hwy 41	0	0	0	0		0	
Total	**10**	**9**	**1**	**10**	**100%**	**0**	**0%**

Based on the documentation of live observations, tracks, and signs, the most prevalent non-avian predator species at Morro Strand this year was red fox, which was detected on 145 of the 154 days that predator monitoring occurred at this site. The second most prevalent non-avian predator species documented at this site was striped skunk, which was detected on 115 monitoring days, followed by raccoon, which was detected on 21 monitoring days, and Virginia opossum, which was detected on 15 monitoring days. The other non-avian predator species documented at Morro Strand this year, which included domestic cat and long-tailed weasel, were detected on less than five monitoring days each. Figure 10 provides a graphical representation of the number of days that each non-avian predator species was detected at Morro Strand in 2020.

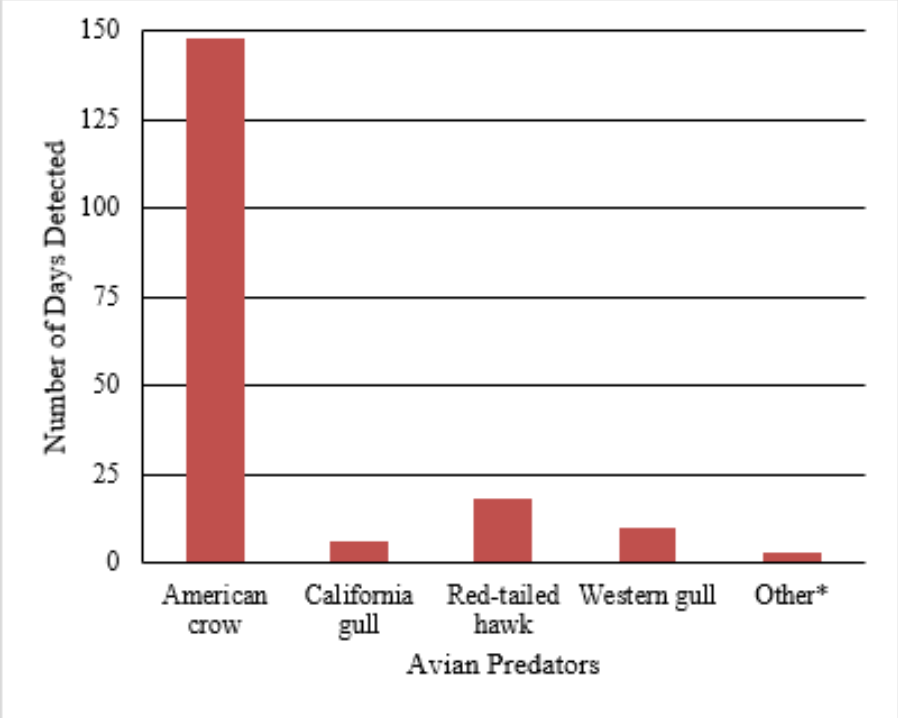
Figure 10: Number of Days Non-Avian Predators Detected at Morro Strand in 2020.



Based on the documentation of live observations, tracks, and signs, the most prevalent avian predator species at Morro Strand this year was American crow, which was detected on 148 of the 154 days that predator monitoring occurred at this site. This species was commonly observed

foraging throughout the entire length of Morro Strand in flocks up to 47 individuals and was responsible for the depredation of at least seven nests at this site this year. The second and third most prevalent avian predator species at this site were Red-tailed hawk, which was detected on 18 monitoring days, and Western gull, which was detected on 11 monitoring days. The other avian predator species documented at Morro Strand this year, which included California gull, Great horned owl, Northern harrier, and Peregrine falcon, were detected on less than five monitoring days each. Figure 11 provides a graphical representation of the number of days that each avian predator species was detected at Morro Strand in 2020.

Figure 11: Number of Days Avian Predators Detected at Morro Strand in 2020.



*Other: Great horned owl, Northern harrier, Peregrine falcon

Sandspit

WSP at the Sandspit also faced record-level nest depredation in 2020, with 70 out of 106 nests found at this site failing due to depredation. This 66% nest depredation rate is the highest that has ever been recorded at the Sandspit since monitoring began in 2001. Additionally, considering the observation that WSP nests at this site were often depredated within one to two days of their initiation this year, it is highly likely that additional WSP nests were depredated before they could be documented by monitors. In past years, the majority of nest depredation at the Sandspit was typically caused by coyote. This year, however, just 13 Sandspit nests were confirmed to be depredated by coyote, while the majority of WSP nest depredation was from avian predator species. Predators from the family Corvidae, which is composed of crows and their relatives, posed a significant problem for WSP breeding success at the Sandspit this year, as members of this family (corvids) were responsible for every WSP nest depredation at this site that could be

attributed to specific avian predator species. This rise in nest depredation by avian predators coincides with the fact that for the second year in a row, Common raven were observed at the Sandspit during the breeding season. In total, Common raven were confirmed to have depredated at least five nests at the Sandspit, American crow were confirmed to have depredated at least four nests, and unknown corvids were confirmed to have depredated at least 16 nests. The avian predator tracks next to these 16 nests were clearly identifiable as corvid tracks but either fell within an overlapping range of measurements or were not clear enough to be accurately measured, which prevented monitors from determining which species of corvid they belonged to. Another 11 nests at the Sandspit were determined to be depredated by unknown avian predator species, and an additional 21 nests at this site were determined to be depredated by predator species of unknown classification. It is highly likely that most, if not all, of these depredations carried out by unknown avian predator species were in fact carried out by corvids, and that a large percentage of the depredations carried out by unclassified predator species were carried out by corvids as well. Large numbers of corvids have been recorded near the Sandspit including as many as 70 American crows being fed by a local resident in the neighboring community of Los Osos. A summary of all documented nest depredations and the locations in which they occurred at this site can be found in Table 26 and Table 27.

Table 13: Nest Depredations by Predator at the Sandspit in 2020.

Total Nests	**106**		
Depredated Nests	**70**	**% Depredated**	**% Total**
Coyote	13	18.6%	12.3%
American Crow	4	5.7%	3.8%
Common Raven	5	7.1%	4.7%
Unknown Corvid	16	22.9%	15.1%
Unknown Avian	11	15.7%	10.4%
Unknown Predator	21	30%	19.8%

Table 14: Distribution of Nest Depredations by Predator at the Sandspit in 2020.

	Predators							
Area	**Coyote**	**American Crow**	**Common Raven**	**Unknown Corvid**	**Unknown Avian**	**Unknown Predator**	**Total Depredated**	**Total Nests**
SPB-RM6	0	0	0	1	0	1	**2**	2
RM6-RM5	0	0	0	4	1	1	**6**	10
RM5-RM4	2	0	0	3	1	8	**14**	27
RM4-RM3	2	1	1	1	3	2	**10**	17
RM3-RM2	2	1	2	0	2	5	**12**	18
RM2-RM1	3	1	1	2	0	1	**8**	12
RM1-SST	3	1	1	2	0	1	**8**	10
SST-HAZ	1	0	0	3	4	2	**10**	10
South HAZ	0	0	0	0	0	0	**0**	0
Total	13	4	5	16	11	21	**70**	106

The entire WSP range has seen a general increase in corvid presence on most beaches. The first evidence that a nest at the Sandspit had been depredated by a corvid species this year was documented on April 15th, and the first confirmed incident of nest depredation by Common raven was documented on April 24th. The last confirmed incident of nest depredation by Common raven at the Sandspit was documented on July 11th, while the last evidence that a nest had been depredated by a corvid species at this site was documented on July 13th. During this time, at least 36 WSP nests at the Sandspit were depredated by corvids and unknown avian predator species. To mitigate the effects of WSP nest depredation carried out by corvids at the Sandspit, mini-exclosures were installed to protect WSP nests in certain locations. Because the exclosures are conspicuous to park visitors, they were only utilized in the more remote areas of the Sandspit to prevent human disturbance of WSP nests. In total, 14 out of the 17 nests that were protected by exclosures hatched successfully. This 82% hatch success rate of exclosed nests at the Sandspit was thus significantly higher than the 6% hatch success rate of unexclosed nests at this site. Of the three exclosed nests that failed to hatch; one failed due to wind; one was determined to be abandoned following evident coyote harassment; and one was determined to be abandoned following evidence that an adult from the nest may have been depredated by coyote. Exclosure use was suspended on the north half of the Sandspit after these three nests failed, and exclosures were only placed on the south half of the Sandspit in locations where coyote activity was minimal. Overall, nests protected by mini-exclosures accounted for 74% of successful hatches at the Sandspit in 2020. A summary of exclosed nest locations and fates at the Sandspit this year can be found in Table 28.

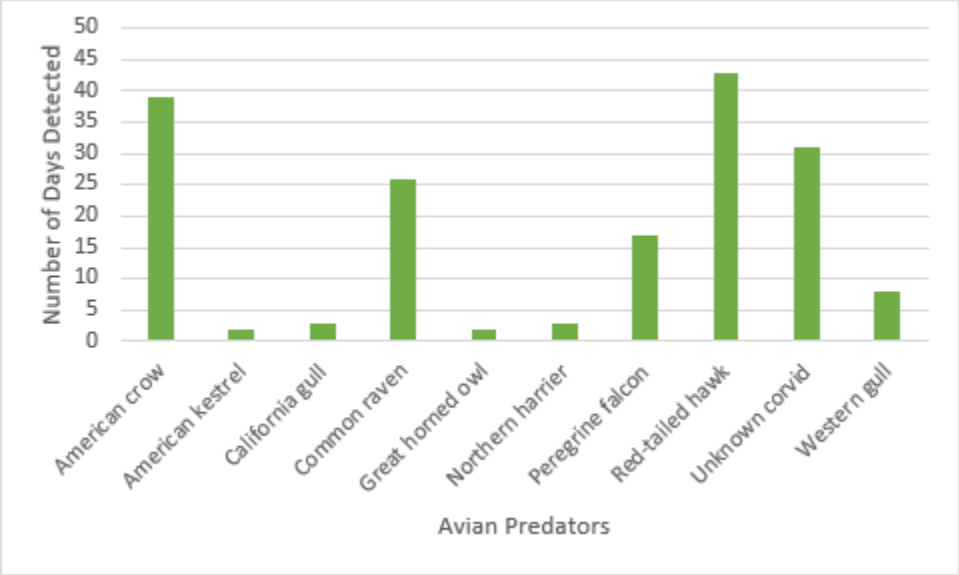
Table 15: Exclosed Nest Locations and Fates at the Sandspit in 2020.

Area	# of Exclosures Installed	Depredated	Abandoned	Wind Fail	Total Fail	% Total Fail	Hatch	% Total Hatch
SPB-RM6	0	0	0	0	0		0	
RM6-RM5	1	0	1	0	1	6%	0	
RM5-RM4	5	0	1	1	2	12%	3	18%
RM4-RM3	3	0	0	0	0		3	18%
RM3-RM2	4	0	0	0	0		4	24%
RM2-RM1	2	0	0	0	0		2	11%
RM1-SST	2	0	0	0	0		2	11%
SST-HAZ	0	0	0	0	0		0	
South HAZ	0	0	0	0	0		0	
Total	**17**	**0**	**2**	**1**	**3**	**18%**	**14**	**82%**

Based on the documentation of live observations, tracks, and signs, the most prevalent non-avian predator species at the Sandspit this year was coyote, which was detected on 139 of the 143 days that predator monitoring occurred at this site. The other non-avian predator species documented at the Sandspit this year, which included striped skunk and raccoon, were detected on less than four monitoring days each.

Based on the documentation of live observations, tracks, and signs, the most prevalent avian predator species at the Sandspit this year was Red-tailed hawk, which was detected on 43 of the 143 days that predator monitoring occurred at this site. The second most prevalent avian predator species at this site was American crow, which was detected on 39 monitoring days, followed by unknown corvid, which was detected on 31 monitoring days, and Common raven, which was detected on 26 monitoring days. Peregrine falcon was detected on 17 monitoring days, and Western gull was detected on eight monitoring days. The other avian predator species documented at the Sandspit this year, which included American kestrel, California gull, Great horned owl, and Northern harrier, were detected on less than four monitoring days each. Figure 12 provides a graphical representation of the number of days that each avian predator species was detected on the Sandspit in 2020.

Figure 12: Number of Days Avian Predators Detected at the Sandspit in 2020.



Predator Removal across District Beaches

In response to the increases in WSP nest depredation observed throughout the District, predator removal activities funded by USFWS for the protection of the District's WSP population were initiated on March 31st and continued through August 27th. These predator removal activities were conducted at Morro Strand and the Sandspit but were not conducted at HSSSP or Villa Creek Beach. Methods of predator removal included both trapping and euthanizing and the use of firearms. Trapping efforts were measured in "trap nights", which is when a trap is set in the evening and checked in the morning. If three traps were set one evening that would be a three trap night. A combined total of 148 trap nights were conducted at Morro Strand and the Sandspit in 2020.

Predator removal activities at Morro Strand were conducted between Highway 41 and the Azure Street parking lot throughout the area located east of the first set of sand dunes. The predator removal effort at this site focused on reducing red fox and striped skunk populations. Two red fox and one striped skunk were captured using Victor #1-1/2 padded jaw leg hold traps, and seven additional striped skunks were captured using 10-inch x 12-inch x 32-inch Tomahawk cage traps. All target species discovered in traps were immediately euthanized with an injection of sodium pentobarbital, and all non-target species were released unharmed. In total, two adult red foxes and eight striped skunks were removed from Morro Strand in 2020.

Predator removal activities at the Sandspit were conducted throughout the length of the CSP property. The predator removal effort at this site focused on reducing coyote, American crow, and Common raven populations. Three coyotes were captured in Victor #3 padded leg-hold traps and euthanized by shooting. A total of three additional coyotes, 18 American crows, and two Common ravens were removed with the use of calls and a firearm. Additionally, six pre-baiting stations were deployed with chicken eggs in an attempt to habituate Common raven and American crow, however neither of these species were observed visiting the pre-bait stations with sufficient regularity to warrant the deployment of the corvicide DRC-1339 treated bait. In total, six coyotes, 18 American crows, and two Common ravens were removed from the Sandspit in 2020.

Banded WSP

Although banding of WSP is not currently conducted in the District, banded WSP from other locations are frequently observed utilizing District beaches. In order to track the activities, movements, and origins of banded WSP utilizing District beaches, monitors maintained a daily log of banded WSP sightings that detailed each color band combination observed, each banded individual's observed activities, the time and location of each sighting, and any evidence of associations with nests or other banded individuals. The origin of each banded WSP observed utilizing District beaches was then determined using data provided by WSP banding locations throughout the United States and Mexico. All District's banded WSP observations in 2020 were entered into a standardized data template and shared with other WSP monitoring and banding programs via a Google group listserv.

This was the fifth year that banded WSP sightings listed on eBird, an online database of bird observations, were included in the District's banded bird log. When combining observations from eBird with those made by monitors, banded WSP with confirmed band combinations were observed a total of 1,138 times at District beaches from October 2019 through September 2020. From these 1,138 observations, a total of 77 unique color band combinations were identified. A total of 38 banded WSP were observed utilizing District beaches during the wintering season (October 2019 through February 2020), and a total of 63 banded WSP were observed utilizing District beaches during the breeding season (March through September 2020). Fourteen of these banded WSP were observed only during the wintering season, 38 were observed only during the breeding season, and 25 were observed during both seasons. The banding locations of all banded WSP observed on District beaches from October 2019 – September 2020 are listed in Table 29.

Table 16: Banding Locations of WSP Observed at District Beaches October 2019 - September 2020.

Banding Location	**# of WSP**
Bahia Todos Santos, Ensenada, Baja CA, Mexico	1
Coronado Naval Air Station (NAS), SeaWorld, San Diego	3
Fort Ord Dunes State Park (SP)	6
Humboldt Bay	1
Marina SB	3
ODSVRA	35
Oregon	8
Pajaro Spit	4
Salinas National Wildlife Refuge (NWR)	1
Salinas River SB	1
Vandenberg Airforce Base (VAFB)	12
Zmudowski SB	2

Eight of the banded WSP observed at District beaches from March 1st to September 30th were confirmed to have nested at District beaches in 2020. An additional four banded WSP observed at District beaches were determined to have potentially nested within the District. However, their associations with these potential nests were never confirmed.

Thirty-eight banded WSP fledglings and juveniles were observed utilizing District beaches from October 2019 to September 2020. The banding locations of these fledglings and juveniles are listed in Table 30.

Table 17: Banding Locations of WSP Juveniles Observed at District Beaches October 2019 - September 2020.

Banding Location	# of WSP Juveniles
Oregon	8
ODSVRA	20
Pajaro Spit	2
VAFB	8

Many banded WSP individuals were observed to be regularly utilizing District beaches throughout the 2019-2020 wintering and breeding seasons. The banded WSP most frequently-observed at District beaches included oy:aa (141 sightings), ow:wr (100 sightings), gg:oa (67 sightings), oa:ya (58 sightings), wg:ab (53 sightings), and vv:or (50 sightings). Two of these WSP fledged from Fort Ord Dunes SP; two fledged from ODSVRA; one fledged from Pajaro Spit; and one fledged from Salinas River SB.

See Appendices 5 and 6 for a list of the band combinations observed and their histories.

Hearst San Simeon State Park

Several beaches within HSSSP had banded WSP throughout the winter and breeding seasons. Further information on these band sightings can be found under the individual beach sections. Piedras Blancas and Sidney's Lagoon were all monitored during the 2020 season but had no banded WSP present.

San Carpoforo Creek Beach

Six WSP with unique band combinations were observed utilizing San Carpoforo Creek Beach from October 2019 – September 2020. All six of these individuals were observed during the wintering season, while three of these individuals were observed during both the wintering and breeding seasons.

The most frequently observed banded WSP at San Carpoforo Creek Beach during this time period was Rw:br. This individual was observed exclusively at this site where he was observed on six days during the wintering season and on four days during the start of the breeding season. He has nested successfully at San Carpoforo Creek Beach in years prior. However, he is not known to have nested within the District this year. Having been banded as an adult in 2009 at Zmudowski SB, Rw:br is the oldest banded WSP known to frequent District beaches. However, his exact age is unknown.

Just one banded juvenile was observed at San Carpoforo Creek Beach during this time period. This WSP, no:yo, fledged from VAFB in 2019.

Point Sierra Nevada

Two banded WSP were observed at Point Sierra Nevada from October 2019 to September 2020. One of these individuals, g/y:y, was a juvenile that fledged from Oregon in 2020, and the other,

vg:ar, is a male that fledged from ODSVRA in 2018. Each were observed on only one day and each were observed only during the breeding season.

Arroyo de la Cruz

Two banded WSP were observed at Arroyo de la Cruz from October 2019 to September 2020. One of these individuals, an:ww, a WSP of unknown sex, fledged from VAFB in 2015, and the other, no:yo, fledged from VAFB in 2019 and was observed as a juvenile. Each were observed on two days each, and each were observed only during the wintering season.

Arroyo Laguna

A total of 14 banded WSP were observed at Arroyo Laguna from October 2019 to September 2020. Of these, two were observed only during the wintering season, seven were observed only during the breeding season, and five were observed during both seasons.

The most frequently observed banded WSP at Arroyo Laguna during this time was gg:pb. A female that fledged from ODSVRA in 2012, gg;pb was observed on 14 days at this site. She was observed three times during the wintering season, and 11 times during the breeding season.

A total of seven banded juveniles were observed at Arroyo Laguna including four juveniles from ODSVRA, two from VAFB, and one from Oregon.

San Simeon Creek Beach

A total of three unique band combinations were seen at San Simeon Creek Beach. Of these individuals, two were seen only during the winter season, and one was seen during both periods. All of these banded WSP were only seen on one or two occasions between October 2019 and September 2020 at San Simeon Creek Beach.

Santa Rosa Creek Beach

A total of eight unique band combinations were observed at Santa Rosa Creek Beach. Of these, five were only observed in the winter, two only in the summer, and one during both periods.

The most frequently observed banded WSP at Santa Rosa Creek Beach was pv:gy (14 sightings), an adult of unknown sex that fledged from ODSVRA in 2018.

Three banded juveniles were recorded at Santa Rosa Creek Beach between October 2019 and September 2020. Two fledged from ODSVRA and the other from Oregon.

Villa Creek Beach

A total of six unique band combinations were observed at Villa Creek Beach. All six of these banded WSP were seen during the breeding season, and all but one were observed during both seasons.

The most frequently observed banded WSP during the 2020 breeding season on Villa Creek Beach was oy:aa (141 sightings). A male who fledged from Salinas River SB in 2018, oy:aa was confirmed to have three nests, one of which hatched and produced one fledgling. The other two nests were depredated by an American crow and an unknown avian predator. A possible fourth nest was depredated by an unknown corvid.

The second most frequently observed banded WSP was ow:wr (96 sightings), a 2015 female that fledged from Fort Ord Dunes SP and has nested at Villa Creek Beach every year since 2016. She successfully hatched two nests in 2020, one of which produced two fledglings.

The third most frequently observed banded WSP was gg:oa (65 sightings), a female who fledged from ODSVRA in 2019. Though she was not confirmed to be paired or with any nest, she was observed on Villa Creek Beach throughout the breeding season.

Morro Strand

A total of 40 unique band combinations were observed at Morro Strand. Eight of these WSP were seen only during the winter months, 28 were seen only during the breeding season, and four were seen during both seasons.

The most frequently observed banded WSP at Morro Strand during the 2020 breeding season was wg:ab (50 sightings) an adult male that fledged from Fort Ord Dunes SP in 2019. He was possibly associated with two nests and was seen alarm calling near them. Both nests were depredated before reaching a full clutch of three eggs; one by a red fox and one by a striped skunk.

The second most frequently observed banded WSP at Morro Strand was vv:or (49 sightings). He fledged from ODSVRA in 2015 and has successfully nested at Morro Strand from 2016 to 2019. In 2020, he had two confirmed nests and one potential nest; however, all three nests were depredated. Two were depredated by American crow and one by a striped skunk. For two of these nests, he was paired with u:or.

The third most observed banded WSP at Morro Strand was u:or (formerly nb:or; 36 sightings). An adult female that fledged from VAFB in 2013 and has nested at Morro Strand or the Sandspit since 2014. During the 2020 breeding season, she had one confirmed nest at Morro Strand with vv:or that failed to American crow. She had another confirmed nest at the Sandspit that failed to coyote, and she also had a potential nest at Morro Strand, also with vv:or, that failed to striped skunk.

The next most observed banded WSP at Morro Strand is a:Rs (35 sightings; red flag band above the joint with white R3). An adult male that fledged from Bahia Todos Santos in Ensenada Baja California Mexico in 2019. During the 2020 breeding season, he had one confirmed nest which failed to an unknown predator on Morro Strand.

Another banded adult WSP that nested at Morro Strand in 2020 is u:rl (27 sightings; formerly oy:rl; fledged from Fort Ord Dunes SP in 2016). She was seen incubating one nest, which eventually failed to a striped skunk.

The only other banded WSP that is believed to have nested on Morro Strand in 2020 was ao:gb (17 sightings). He was from a nest that was collected from Coronado NAS and then reared and banded at SeaWorld in 2018. He had one potential nest that failed to an unknown predator.

Between October 2019 and September 2020, a total of 18 banded juveniles were observed at Morro Strand. Thirteen of these juveniles fledged from ODSVRA, four from VAFB, and one from Oregon.

Sandspit

A total of 38 unique WSP band combinations were observed on the Sandspit from October 2019 – September 2020. Eight were observed at this site only during the wintering season, 22 were observed only during the breeding season, and an additional eight were observed during both seasons. The rapid depredation of WSP nests on the Sandspit this year, which often took place before the start of nest incubation or shortly thereafter, made it unusually difficult to confirm banded WSP associations with known nests throughout the season.

The most frequently observed banded individual at the Sandspit during the 2019-2020 season was oa:ya (55 sightings). A 2014 fledgling from Pajaro Spit, oa:ya was observed almost exclusively on the Sandspit this season, with only three additional sightings at Morro Strand. He had two confirmed nests at the Sandspit this year and was potentially associated with one additional nest there as well. While one of his confirmed nests successfully hatched and produced one fledgling, the two other nests that he was associated with both failed. His other confirmed nest was depredated by an unknown corvid within five days of the third egg being laid, while his potential nest was depredated by a coyote within nine days of the third egg being laid. He has been confirmed to have nested on the Sandspit every year since 2016.

The second most frequently observed banded WSP on the Sandspit this season was rb:bg (44 sightings). A fledgling from Fort Ord Dunes SP in 2015, rb:bg was also observed almost exclusively on the Sandspit this season, with only two additional sightings at Morro Strand. He had one confirmed nest at the Sandspit this year and was potentially associated with one additional nest at this site as well. While his confirmed nest successfully hatched, none of the chicks survived to fledge. The other nest that he was potentially associated with was depredated by an unknown predator one day after the second egg was laid.

The 2013 VAFB female, u:or, was observed on the Sandspit six times this season. She had one confirmed nest on the Sandspit that was depredated by a coyote within four days of being discovered at three eggs. She has now been confirmed to have nested on the Sandspit in 2014, 2015, 2018, 2019, and 2020. After her nest failed on the Sandspit, u:or nested at Morro Strand without success.

A female WSP from a nest that was collected at Coronado NAS and then reared and banded at SeaWorld in 2018, ao:bg, was observed on the Sandspit 18 times this season. She was possibly associated with two nests on the Sandspit this year. The first nest was depredated by an unknown avian predator one day after being discovered at one egg, so her association with the nest could not be confirmed. Her second possible nest was depredated by an unknown predator three days after it was discovered at two eggs. She was confirmed to have successfully nested on this beach in 2019.

A 2014 Marina SB fledgling, ay:aa, was observed 16 times on the Sandspit this year and was possibly associated with two nests at this site. However, both nests were rapidly depredated

before his association with them could be confirmed. One of these nests he may have been associated with was depredated by an unknown avian predator within one day of the second egg being laid, while the other nest was depredated by American crow within two days of the third egg being laid. He has been confirmed nesting on the Sandspit every year since 2016.

A WSP banded as an adult at Zmudowski SB in 2019, Bg:yr, was observed on the Sandspit 31 times this season. However, he was never associated with a nest in 2020.

A fledgling from ODSVRA in 2012, gg:pb, was observed 28 times on the Sandspit this season. She had nested every year on the Sandspit since 2014. However, she was never linked to a nest in 2020.

Five banded juveniles that fledged on other beaches during the 2019 breeding season were observed on the Sandspit during the wintering months. Three of these juveniles were from ODSVRA; one was from Oregon; and one was from VAFB.

Fourteen banded juveniles that fledged on other beaches during the 2020 breeding season were observed on the Sandspit. Nine of these juveniles were from ODSVRA; two were from Oregon; two were from the Pajaro Spit; and one was from VAFB.

Injured/Dead WSP

Throughout the year, monitors recorded injured or dead WSP seen on the beach and notified the WSP Program Coordinator. Depending upon each situation, intervention may or may not have taken place. One banded female WSP, one banded male, one banded WSP of unknown sex, two unbanded females, three unbanded adults of unknown sex, one juvenile, and three unbanded WSP of unknown sex and age were observed injured during the 2020 season. There were also two adult WSP found dead and one partial adult-sized wing found during the 2020 season. See Appendix 7 for a summary of the injured and dead WSP on District beaches from October 2019 through September 2020.

Hearst San Simeon State Park
Three injured WSP and one dead WSP were observed in HSSSP during the 2020 season.

One unbanded WSP of unknown sex and age was seen holding up its left leg at San Simeon Creek Beach on October 29th. The WSP was observed only utilizing its right leg and did not lower its left leg. Photographs were taken, and the WSP was not observed again.

One unbanded WSP of unknown sex was seen at San Carpoforo Creek Beach on November 12th with its right leg held up and not used when moving. The WSP was not observed again.

One unbanded adult male WSP was found dead at Santa Rosa Creek Beach on January 2nd by a local citizen and reported to the WSP Program Coordinator. The WSP was collected and mailed to CDFW Marine Wildlife Veterinary Care and Research Center on February 6th for a necropsy

with USFWS approval. Examination revealed a lower abdominal puncture wound, additional puncture wound near the left scapula, and acute hemorrhage in the occipital portion of the skull. The necropsy determined that the cause of death was acute trauma from an unknown origin, but the injuries were suggestive of a depredation event.

Banded WSP gg:pr of unknown sex (banded as a chick at ODSVRA in 2016) was seen on August 3rd at Arroyo Laguna with its left leg held up and its foot swollen. Photos were sent to USFWS to determine further action. It was captured on August 6th and taken to Pacific Wildlife Care (PWC) for veterinary care. There was abnormally thickened skin on its left foot, which caused constriction to the end of two digits. All bands were removed from its legs and extensive necrosis caused the auto-amputation of the two outer toes on its left foot leaving only the middle toe intact. The WSP was released successfully at Arroyo Laguna on August 18th.

Villa Creek Beach

Two injured WSP were observed on Villa Creek Beach during the 2020 season.

Banded female WSP, u:rl, (formerly oy:rl, fledged from Fort Ord Dunes SP in 2016) was captured at Morro Strand on September 26, 2019 to remove bands on its left leg after a bony protrusion was observed above the bands. She was observed behaving normally 15 times at Villa Creek Beach during the 2020 season. On August 11th, this WSP was observed only utilizing its left leg and holding up its right leg at Morro Strand. See the Morro Strand "Injured/Dead WSP" section for more information on u:rl.

One injured, unbanded female WSP was observed on October 1st with a missing right foot. The WSP was observed limping on its stump and successfully foraging 19 additional times until September 22nd, and no further action was taken.

Morro Strand

Six injured and one dead WSP were observed on Morro Strand during the 2020 season.

Banded female WSP, u:rl, (formerly oy:rl, fledged from Fort Ord Dunes SP in 2016) was observed on December 15th at Morro Strand with a previously recorded bony protrusion on its left, unbanded leg. She foraged fine and was observed 26 additional times until September 17th at Morro Strand. She was also occasionally seen at Villa Creek Beach. This WSP was confirmed to have one nest on Morro Strand in the 2020 breeding season. On August 11th, the WSP was observed not putting weight on its right, banded leg and limping while foraging. USFWS and Doug George with Point Blue Conservation Science were notified of the situation. Several attempts were made to capture the WSP on August 18th, 19th, and 28th with no success. The WSP was later observed walking normally and putting weight on its right leg. No further attempts at capture were taken during the 2020 season.

One injured, unbanded WSP of unknown sex was observed on January 21st holding up its right foot with what appeared to be fishing line extending a few inches from it. After discussions with USFWS and Doug George, a capture was attempted on January 22nd, but the WSP was not re-found. This bird was not observed again during the 2020 season.

One injured, unbanded female WSP was observed on January 22nd holding up its right leg with its toes hanging limply. The WSP was observed 44 times on Morro Strand and five times on the Sandspit in 2020. Its right leg was observed over these successive observations to become oriented 90° horizontally causing the leg to protrude between its primary feathers when standing. Doug George observed this WSP while looking for a different injured WSP and decided to not capture it, since the injury did not appear to be human caused. The WSP was able to preen with its injured leg and forage successfully. No actions were taken to capture it. The WSP was observed paired and sitting in a scrape during the breeding season but was not known to have nested.

One injured, unbanded adult WSP of unknown sex was observed on March 2nd with a missing right foot. The WSP foraged successfully, and no further observations were made.

One injured, unbanded female WSP was observed on April 21st with most of its right leg missing. The WSP moved and foraged successfully and was not observed again.

One injured, unbanded WSP of unknown sex and age was observed on August 25th and 28th with its left foot curled under its body when standing still. No action was taken to capture it.

On February 5th, an adult WSP was found dead and highly decomposed and scavenged and therefore, not collected. There was no apparent cause of death.

Sandspit

Between October 2019 and September 2020, three injured WSP were observed and one partial WSP wing was recovered on the Sandspit.

One unbanded, injured female WSP was first observed on June 3rd on the Sandspit. This WSP's right leg was bent up and away from its body with no obvious cause of injury. The individual was observed successfully foraging with the use of its remaining leg, and it was determined to be the same individual that had been previously observed on Morro Strand, where Doug George decided not to capture it due to the injury appearing to not be human caused. The individual was observed on the Sandspit on five separate occasions during the 2020 season.

One unbanded, injured juvenile WSP was observed on July 4th with its right wing drooping. The WSP was observed foraging successfully and flying a short distance despite its injury. This individual was not observed again during the 2020 season, and no action was taken to capture it.

One banded, male WSP, Oy:u, (formerly Oy:br, banded as an adult at Fort Ord Dunes SP in 2016) was first observed on August 7th with its right bands missing. Oy:br has wintered on the Sandspit since 2016. The right bands were removed during the 2020 season at Fort Ord Dunes SP due to an injury, which caused the loss of a toe on its right foot. The injury did not appear to impair movement. This individual was observed 11 additional times during the 2020 season.

One partial wing from an adult sized WSP was found on July 6th. This wing is believed to have belonged to an adult from nest NSS036, which was determined to be abandoned shortly after the

wing was found. The wing was originally discovered approximately 15 feet outside of this nest's exclosure, which had coyote tracks observed several times around the exclosure location for seven days before the wing was found. The discovery of the wing was documented with photos and its location was recorded using a handheld GPS unit before being collected.

Human Activities

Human activity is monitored and recorded on District beaches throughout the breeding season to deter and manage disturbance to WSP breeding activities. Data recorded included dog contacts, dog tracks, foot traffic, trespassing, vandalism, kite and drone use, and public contacts.

Dogs are not permitted on District WSP beaches, except for San Carpoforo Creek Beach in HSSSP. The ambiguous property boundary dividing beach ownership between CSP and the United States Forest Service makes enforcement of dog restrictions at San Carpoforo Creek Beach difficult. On all other beaches, however, visitors seen with dogs were contacted and requested to leave the beach. Dog walkers that were unable to be contacted, usually due to distance from the WSP monitor, were recorded in the field notes and depending on the location of the dog walker a Ranger was notified. Rangers would occasionally make dog contacts when they were able to.

Individual human tracks within the symbolically fenced nesting habitat or "foot traffic" was also recorded. People found trespassing within the nesting area were contacted when possible. Other public contacts recorded outside of the nesting area were generally beach visitors asking specific questions.

Hearst San Simeon State Park

The majority of HSSSP beaches tend to receive fewer visitors than other beaches in the District, but visitation has greatly increased in recent years. San Carpoforo Creek Beach, Arroyo Laguna, San Simeon Creek Beach, and Santa Rosa Creek Beach were the most popular beaches within HSSSP in 2020. Several people reported to monitors of having seen over 50 tents at San Carpoforo Creek Beach on several summer weekends.

Fifty non-infraction public contacts were made by WSP monitors at HSSSP beaches throughout the course of the year. These contacts involved 87 visitors, and all contacts were recorded as positive in nature. During these contacts, WSP monitors answered questions regarding WSP, elephant seals, and additional topics pertaining to the park system and local area.

Illegal dog walkers were personally contacted by monitors 12 times at HSSSP in 2020 and an additional three illegal dog walkers were observed throughout the park on instances in which monitors were unable to make contact. Additionally, illegal dog tracks were observed and recorded 41 times on HSSSP beaches where dogs are not allowed. Table 31 provides a summary of dog contacts and dog tracks recorded in this region of the District in 2020.

Table 18: Dog Tracks and Dog Contacts at HSSSP in 2020.

Area	Dog Tracks	Dog Contacts
Point Sierra Nevada	1	0
Arroyo de la Cruz	0	0
Sidney's Lagoon	2	0
Piedras Blancas	1	0
Arroyo Laguna	5	3
San Simeon Creek Beach	8	1
Santa Rosa Creek Beach	24	11
Total	**41**	**15**

San Simeon Creek Beach and San Carpoforo Creek Beach were the only HSSSP beaches where symbolic fencing was installed to protect WSP nesting habitat in 2020. Additionally, Sidney's Lagoon is blocked off by a permanent fence to prevent visitors from disturbing elephant seals. San Simeon Creek Beach's fence was erected on February 27th and removed on June 30th, while San Carpoforo Creek Beach's fence was erected on April 2nd and removed on June 3rd. Two sets of foot traffic and four sets of dog tracks were recorded within the fenced off areas of these beaches in 2020, however limited monitoring in HSSSP likely resulted in the non-documentation of additional infractions.

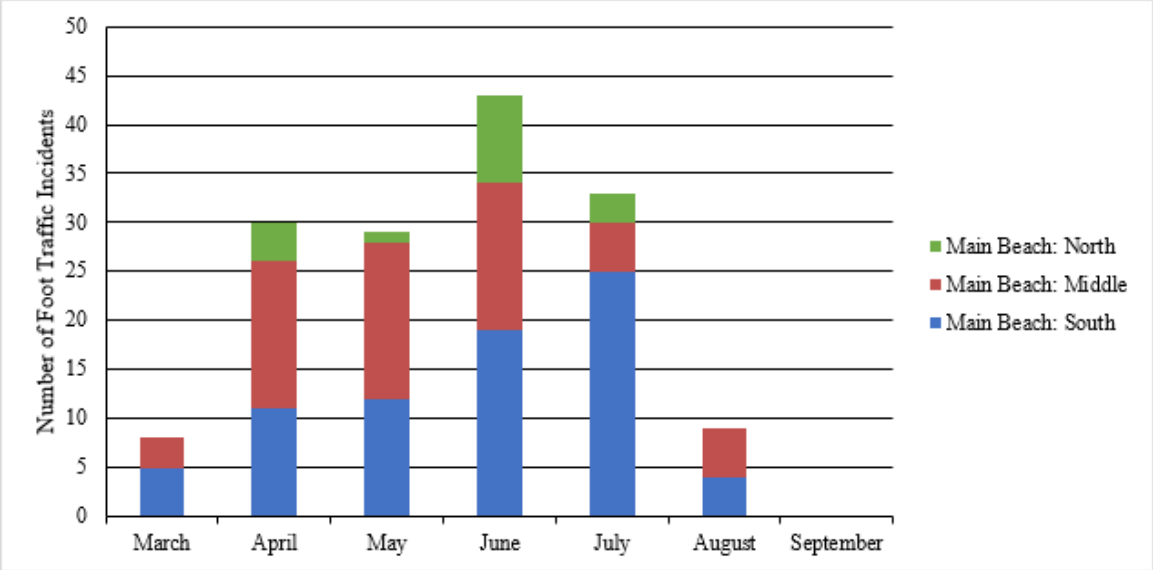
Various acts of vandalism were documented in 2020 at HSSSP beaches, including nine defaced signs, six illegal fire pits, and one illegal campsite.

Villa Creek Beach

Visitation to Villa Creek Beach greatly increased in 2020. On July 4th, 33 vehicles were recorded parked in the parking lot directly accessing Villa Creek Beach. Rangers also reported seeing over 100 vehicles parked in the pullouts along EBSP during the summer. WSP protection measures to eliminate pedestrian access through nesting habitat continued this year at Villa Creek Beach. Former trails continued to be fenced off, and "Do Not Enter" signs were clearly posted.

There were 152 documented incidents of human foot traffic inside the nesting area, although the actual number of people entering the nesting area could have been higher due to the difficulty of deciphering individual footprints. The greatest number of foot traffic incidents occurred during the month of June (Figure 13). The largest amount (50% of all foot traffic) was recorded on the south end of the main beach.

Figure 13: Distribution of Foot Traffic by Month at Villa Creek Beach in 2020.



When seen, trespassers were contacted and informed about the rules and regulations regarding the closed areas and educated about the WSP breeding season. Monitors witnessed two separate incidents (two individuals) of trespassing inside the fenced off areas. Both contacts were recorded as positive.

Monitors made two contacts in 2020 for illegal dog walking on Villa Creek Beach. Both of these illegal dog walkers were contacted personally by monitors with one contact recorded as positive and the other as negative. The negative contact resulted in a CSP Ranger issuing a citation. Ten additional dog contacts were made on the access trail and parking lot to Villa Creek Beach. Of these contacts nine were considered positive, while one was considered neutral because the monitor did not make personal contact with the dog walker. In addition to contacts for illegal dog walking, 17 sets of dog tracks were observed on Villa Creek Beach during the 2020 season. Ten of these occurred inside the fenced nesting area, and seven occurred outside.

A summary of the distribution of dog tracks, dog contacts, and foot traffic at Villa Creek Beach is available in Table 32 and in Table 33 comparing these totals to previous years.

Table 19: Dog Tracks, Dog Contacts, and Foot Traffic at Villa Creek Beach in 2020.

Area	Dog Tracks*	Dog Contacts*	Foot Traffic
Back Area	0	0	0
West of Villa Creek	0	0	0
Main Beach: North	1	0	17
Main Beach: Middle	5	1	59
Main Beach: South	11	1	76
Pocket Beaches	0	0	0
Total	**17**	**2**	**152**

*Dog tracks and dog contacts were only recorded on Villa Creek Beach

Table 20: Dog Tracks, Dog Contacts, and Foot Traffic at Villa Creek Beach 2014-2020.

	Dog Tracks	Dog Contacts	Foot Traffic
2020	**17**	**2**	**152**
2019	22	4	180
2018	38	6	104
2017	36	13	179
2016	10	5	80
2015	6	6	135
2014	11	2	108

During the 2020 breeding season, Rangers gave a minimum of one citation at Villa Creek Beach for a dog violation. Sixty additional public contacts involving 109 people were made throughout the year at Villa Creek Beach by WSP monitors. In most instances, the visitor approached the monitor with various questions or comments. All were considered positive contacts.

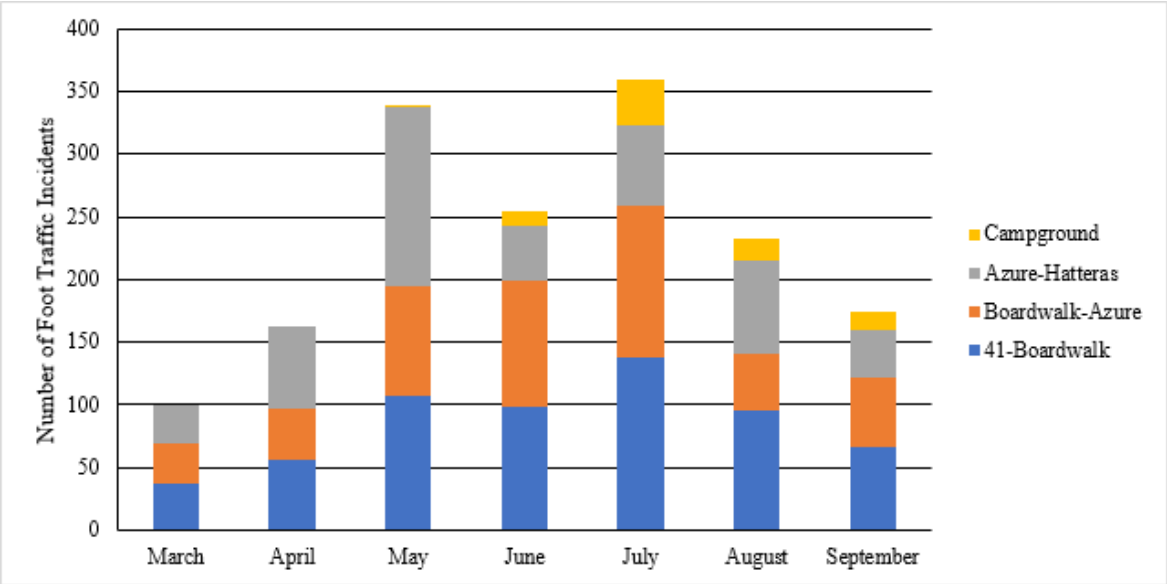
Two acts of vandalism on Villa Creek Beach in 2020 occurred in June, which included one bent pole, and three rocks being spray painted with large graffiti.

Morro Strand

Morro Strand is easily accessible to local residents and visitors and typically has a high level of recreational use compared to other District beaches. Even with the campground closed most of the breeding season due to COVID-19 restrictions, there were still large numbers of visitors on the beach. In 2020, there was a total of 1,621 documented incidents of human foot traffic inside

the fenced nesting area. May and July had the greatest number of foot traffic incidents with 339 and 359, respectively (Figure 14). The foot traffic recorded in these months was distributed evenly along the length of the beach.

Figure 14: Distribution of Foot Traffic by Month at Morro Strand in 2020.



Homeless camps were suspected to be behind the foredunes between the Azure and Highway 41 Corridors. Multiple sets of foot traffic, often accompanied by bike tracks, were observed leading from the area behind the nesting habitat to the Highway 41 Corridor or the beach. On four occasions, foot traffic was ten feet or less from an active nest. The homeless activity at Morro Strand was much less than prior seasons. Two homeless camps were cleaned up in February before the symbolic fence was installed.

In 2015, a path cutting through a heavily vegetated area and the closed nesting habitat between the Easter Street and Sienna Street Corridors was discovered. The path was established near the rear entrance of a couple houses on Beachcomber Street that had been associated with frequent foot traffic and chronic trespassing in past years. Efforts have been made by CSP staff to block these paths with brushy debris and through revegetation. In 2020, the trail was finally completely grown over and was not reestablished.

In 2020, monitors witnessed 39 individuals trespassing inside the WSP nesting area during 18 incidents. Thirteen of the contacts were recorded as positive and five as neutral. Four of the neutral contacts were visual as the monitor could not make personal contact with those trespassing. The other neutral contact was waved at by a monitor from afar to signal them to get out of the habitat. There were no negative public contacts.

A Superintendent's Posted Order was issued stating that no person shall operate, fly, release, or cause to be operated, flown, or released any size kite, or other device, free flying or by remote control, within or 300 feet adjacent to the symbolically fenced WSP nesting area. Regulatory signs stating that kite flying is not allowed were also placed at each Morro Strand access

corridor. There were nine kite, three drone, and two motorized paraglider incidents this year on Morro Strand. Kite flyers were contacted on six out of the nine incidents. All but one of these contacts were positive. WSP monitors also observed three drones and two powered paragliders in violation of the posted order. Contact was made with two drone operators and contact with the other was attempted. One paraglider was observed flying low over the beach and the monitor signaled to them to fly over the ocean and was able to explain the rules to them after they landed. A Ranger was contacted when another paraglider was witnessed but contact could not be made with the pilot.

A sandwich board with a "No Dogs on Beach" sign was placed at CSP boundaries near the high tide line on Morro Strand. Since the signs are not permanent installations, their condition was checked daily throughout the breeding season. These signs established a more visible CSP boundary marker to lessen confusion about the change in regulations. Permanent "No Dogs on Beach" signs cannot be positioned closer to the water due to the fluctuating tides. Another sandwich board sign is in place near the entrance to the beach at the Highway 41 Corridor. This sign illustrates with arrows the City/CSP boundary and in which direction dogs on-leash are allowed. Maps were also placed at the kiosks at Morro Strand, which differentiated areas where dogs are and are not allowed.

Despite the posted signs, there were 260 dog contacts involving 500 people and 319 dogs. During these 260 contacts, dogs were observed as being off leash in 80 of them. Of the total contacts, 210 were recorded as positive, 46 as neutral, and four as negative. Monitors made personal contact with dog walkers in 220 incidents involving 441 people. The remaining contacts were visual due to distance from or evasion of the monitor, which also accounted for most of the neutral contacts. In addition to contacts with illegal dog walkers, 390 sets of dog tracks were observed along the beach (outside the fenced nesting area), and 123 sets were recorded within the nesting area.

A summary of the distribution of dog tracks, dog contacts, and foot traffic is available in Table 34 and in Table 35 comparing these totals to previous years.

Table 21: Dog Tracks, Dog Contacts, and Foot Traffic at Morro Strand in 2020.

Area	Dog Tracks	Dog Contacts	Foot Traffic
North Point-Campground	59	31	NA
Campground-Hatteras	66	7	79
Hatteras-Azure	129	53	460
Azure- Boardwalk	109	70	483
Boardwalk-Hwy 41	150	99	599
Total	**513**	**260**	**1621**

Table 22: Dog Tracks, Dog Contacts, and Foot Traffic at Morro Strand 2014-2020.

	Dog Tracks	Dog Contacts	Foot Traffic
2020	**513**	**260**	**1621**
2019	508	164	1048
2018	459	204	990
2017	668	247	2254
2016	162	96	978
2015	130	102	1387
2014	279	152	1353

During the 2020 breeding season, Rangers contacted a minimum of 40 individuals at Morro Strand primarily for dog and trespass violations. An additional 149 public contacts involving 229 people were made throughout the year at Morro Strand by WSP monitors. In most instances, the visitor approached the monitor with various questions or comments. All of the contacts were positive.

Morro Strand was monitored on all days before and after the July 4th holiday. Two WSP monitors were on the beach on the 4th of July from approximately 8:00 am until 9:00 pm. They answered questions, ensured visitors were following CSP regulations, and monitored WSP activity. There were no public fireworks displays in any nearby towns in 2020 due to the COVID-19 pandemic. Monitors made five dog contacts and six public contacts. Illegal fireworks being set off at Morro Strand were not witnessed by monitors, but fireworks in the surrounding neighborhoods were abundant.

Vandalism was discovered by monitors on 20 days this season. The most frequently recorded form of vandalism was removed poles (20) and bent poles (11) which were both recorded on four occasions. Additional incidents involved defaced signs (6), missing signs (4), and a bent sign (1). Monitors also observed evidence of fire pit (2), illegal camping (1), and a fort inside the nesting area (1).

In 2020, one organized virtual run involving an unknown number of participants occurred on Morro Strand during the WSP breeding season. The “Brian Waterbury Memorial Rock to Pier Fun Run and Rock’n Around the Pier Half Marathon”, occurred on July 25th. On this day there were 11 dog contacts with 22 dogs and 24 people. This year, the race was unknown to WSP monitors and a member of the public informed the monitor on duty about the virtual race, and the

many dogs they had seen. Races are usually observed by WSP monitors to ensure compliance with beach regulations, such as the prohibition of dogs and drones and no trespassing inside the fenced off nesting area.

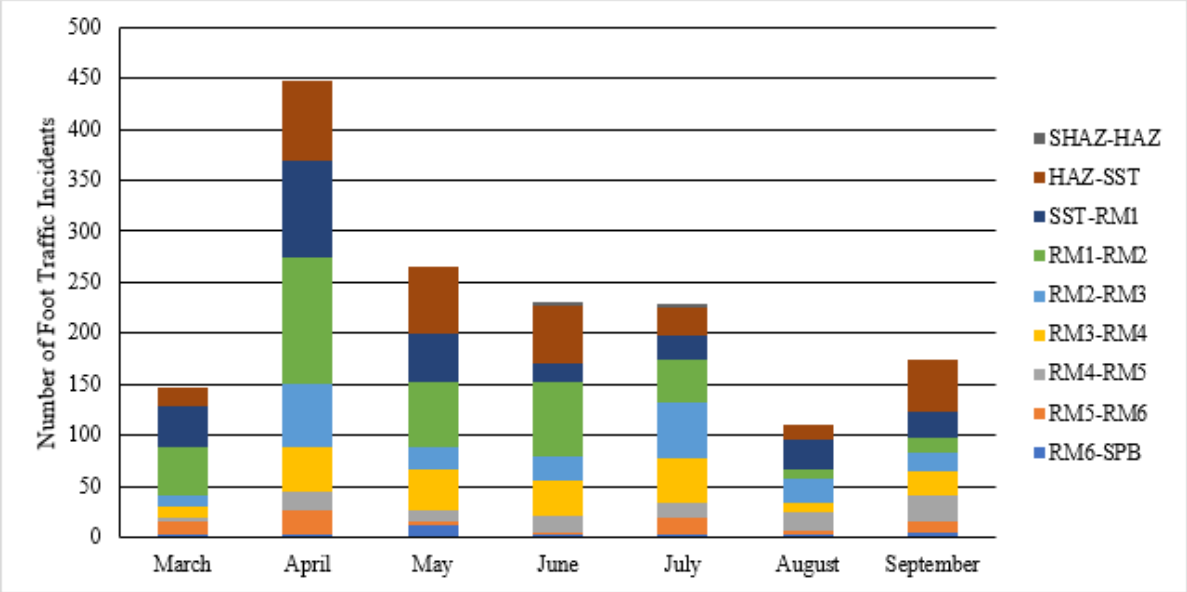
Sandspit

The Sandspit experiences a lower intensity of human activity compared to other District beaches. As usual, the highest concentration of human activity occurred at the south end of the Sandspit. Equestrians and pedestrians gained access to the beach from the Hazard Reef Trail, American Canyon Trail, Sandspit Trail, Rim Trail, Army Road, and Shark's Inlet Corridor. The main pedestrian access point is the Sandspit Trail. This trail is popular with first time park visitors and is a regular route for surfers to access the ocean.

In 2020, WSP monitors witnessed 17 trespass violations involving 40 violators. Fourteen of these trespass incidents occurred on the southern half of the Sandspit. When possible, trespassers were contacted by WSP monitors. All but three groups of violators were contacted by WSP monitors and instructed to leave the nesting area. The trespassers who were not contacted were too far away from the monitor to be communicated with.

Monitors also recorded 1,602 incidents of foot traffic inside the WSP nesting area with 80% of these incidents occurring on the southern half of the Sandspit. The actual number of violations could be higher, as individual footprints are often difficult to count at locations where more than one person has entered the nesting area. Additionally, soft sand and wind often obscure individual footprints making them hard to differentiate and count. On three occasions, trespassers' tracks were seen within one to four feet from a nest. On one occasion tracks from trespassers went directly over a nest. April had the greatest amount of foot traffic with 448 tracks recorded (Figure 15).

Figure 15: Distribution of Foot Traffic by Month at the Sandspit in 2020.



Paddlers (i.e., kayakers, stand-up paddle boarders, and boaters) reached the Sandspit from various mainland launching areas. Large red flags were placed on the bayside corridor entrances to guide kayakers to the non-restricted points of access. The flags could be seen from most of the kayak launching areas on the mainland, although occasional vandalism of the flags may have impeded visibility. Laminated maps attached to posts were also placed on the bayside of the Sandspit at the restricted landing spots. These maps informed individuals of their current location and the location of beach access corridors nearby. However, patterns of foot traffic indicated that people sometimes ignored signs and continued west to the beach through WSP nesting area.

Monitors made 26 contacts of illegal dog walkers (33 total dogs) on the Sandspit. Two dog contacts occurred on the north half of the Sandspit, and 24 occurred on the south half. Monitors were able to personally contact the owner of the dogs on 20 occasions. Of the six instances where dog owners were not contacted, three were due to the distance between the dog owner and monitor, two were reported from a volunteer, and one left the beach upon seeing the monitor. In addition to contacts with illegal dog walkers, dog tracks were observed 45 times inside the fenced nesting area and 78 times outside the nesting area. A total of 107 of the 123 dog tracks occurred on the south half of the Sandspit.

A summary of the distribution of dog tracks, dog contacts, and foot traffic is available in Table 36 and in Table 37 comparing these totals to previous years.

Table 23: Dog Tracks, Dog Contacts, and Foot Traffic at the Sandspit in 2020.

Area	Dog Tracks	Dog Contacts	Foot Traffic
SPB-RM6	3	1	29
RM6-RM5	1	0	73
RM5-RM4	4	0	110
RM4-RM3	11	2	202
RM3-RM2	10	0	217
RM2-RM1	24	5	371
RM1-SST	19	4	280
SST-HAZ	32	8	313
SOUTH HAZ	19	6	7
Total	**123**	**26**	**1602**

Table 24: Dog Tracks, Dog Contacts, and Foot Traffic at the Sandspit 2013-2020.

	Dog Tracks	Dog Contacts	Foot Traffic
2020	123	26	1602
2019	74	17	845
2018	136	43	1281
2017	98	37	1070
2016	42	25	509
2015	39	28	659
2014	25	22	1003
2013	19	14	774

There were two violations of the aerial restriction rule observed this year. First, a group of three paragliders were flying over the WSP habitat near SST. After waving and gesturing for them to move further south, they complied and moved. On the second occasion, there was an individual flying a drone over the Sandspit Trail parking lot. The person left after being informed drones are not allowed.

During the 2020 breeding season, Rangers contacted a minimum of seven individuals on the Sandspit primarily for dog violations. There were 155 additional public contacts involving 272 people made throughout the year by WSP monitors. One hundred fourteen (74%) of those contacts occurred on the southern half of the Sandspit. In most instances, the visitors approached monitors with various questions or comments. All personal contacts made were positive except for one, which was negative.

Several forms of vandalism occurred on the Sandspit in 2020. These included three instances of the fence rope being cut and two incidents of signposts being removed. Monitors also observed evidence of three illegal campfires.

CONCLUSIONS

In 2020, the San Luis Obispo Coast District continued to work towards achieving recovery goals and objectives as outlined in the USFWS Recovery Plan for Recovery Unit 5. During the range-wide breeding window survey on May 19th, a minimum of 77 adult WSP were observed, including 38 males, 36 females, and three individuals of an unknown sex. If the minimum number of breeding adults is calculated from the maximum number of active nests at one time plus the number of males with chicks during the same time period, then the District breeding adult total was 56. According to the USFWS Recovery Plan, the overall recovery population potential for the District is 159 individuals, meaning the District did not meet recovery potential in 2020 using two different methods to obtain adult breeding numbers. Additionally, none of the individual District beaches met recovery standards in 2020.

Appendix 10 depicts the number of nests found by month on all District beaches. Data is included for the years 2004 through 2020 for comparison. Across the District, the highest number of nests found in one breeding season occurred in 2004. After the 2004 season, the total number of nests steadily decreased until 2008. After 2008, the number of nests fluctuated year to year, with an overall increasing trend until 2015. The number of nests in the District have decreased steadily since 2016. The number of District nests in 2020 (164) was well below the average number of nests in the District during the previous 16 years (235).

Tables in Appendix 10a provide a summary of nest initiation dates for all District beaches from 2002 through 2020. Nests on District beaches in previous seasons have been initiated as early as March 9th. The average first nest initiation date over the past 20 years is March 30th. In 2020, the first nest for the District was initiated on the Sandspit on approximately March 18th. The last nest initiated in the District was also on the Sandspit and was found with two chicks in the nest bowl on August 6th. The last chick observed on the Sandspit occurred on September 1st, which is nine days earlier than the last fledgling of the 2019 season. The 2020 breeding period was 167 days, which is one day shorter than the 2019 breeding period.

District beaches had a hatch rate of 15% in 2020 (Appendix 10d). This hatch rate was significantly less than the average of 47% (years 2001-2019) and represents a decrease of 18% since 2019. The number of nests hatched in 2020 (24) was drastically below the average of 105 (2001-2019). This resulted in a total of 32 fewer nests hatched in 2020 across the District than in the previous year.

Nesting success has varied on District beaches between 2001 and 2020 (Appendix 10e). The continuing trend for Villa Creek Beach has been a steady decline in the number of hatches since it was opened to the public in 2001. In 2020, there were five recorded hatches compared to the four hatches in 2019. Morro Strand, however, had a catastrophic breeding season in 2020, where 40 out of 44 nests were depredated and all nests failed. Compared to the 2019 season that had the highest number of nests to hatch on Morro Strand since 2011. At the Sandspit, there was high nest success during the 2004 season, followed by a rapid drop through 2007, from which time the nest numbers fluctuated but with an overall increase until 2017. This year though, the number of Sandspit hatches in 2020 (19) was much lower than the average of 92 between 2003 and 2019.

A total of 119 nests were depredated in 2020, representing a 73% depredation rate across District beaches (Appendix 13). Throughout the previous 19 years, the average depredation rate has been 33%. Villa Creek Beach had 64% of nests depredated this year, which is above the average of 45%. Morro Strand had the highest depredation rate of any beach within the last 19 years with 91% (40 out of 44) of nests being lost to depredation. The average nests lost to predators at Morro Strand is 36%. The Sandspit had an above average year with 66% of nests lost to depredation (the average being 31%). Most of the depredated nests on Villa Creek Beach were due to unknown avian predators (5). Morro Strand was impacted most by striped skunk (13) and unknown predators (12). Most depredations on the Sandspit were due to corvids in 2020 (25). Almost the same number of nests were lost to unknown predators, as well (21).

Nesting activity across District beaches was analyzed between 2001 and 2020 to determine beach productivity (Appendix 10e). The Sandspit, since 2003, has hatched 50% of 3,058 nests.

Since 2001, Morro Strand (30% hatched out of 482 nests) has been less productive than Villa Creek Beach (37% of 567 nests). HSSSP has had very few nests historically but has been productive (65% of 36 nests) within its small sample size. All percentage calculations exclude nests with unknown fates.

Examination of nest failures (Appendix 15) reveals that WSP at all District beaches are vulnerable to the same threats. However, it is notable that at Villa Creek Beach, nest loss due to depredation (45%) is substantially higher than the District average of 33%. Morro Strand has a rate of nest abandonment (16%) well above the District average of 8%. The District average for nests failing to unknown causes is 2%.

Out of 376 eggs observed on District beaches in 2020, a total of 62 chicks hatched this year. There was a total of 15 confirmed fledglings on District beaches in 2020. This is a significant reduction in hatch and fledgling success compared to 2019, which saw 141 hatched chicks and 51 fledglings. As has been the case in years past, the absence of leg banding practices on District beaches posed a significant challenge in the tracking of chicks from hatch to fledge. Since there are relatively few nests at Villa Creek Beach and no nests hatching on Morro Strand in 2020, the accuracy of observing and counting fledglings at those locations was much greater than on the Sandspit.

Threats to WSP nesting and WSP recovery in general continues to be an issue on District beaches. As in previous seasons, nest depredation remains a primary problem due to a significant number of predators active on District beaches. Other threats include illegal trespass into WSP nesting areas, disturbance caused by dogs and park visitors, high winds, and impermanent program funding. Significant high surf and tide events also continue to threaten WSP. The increasing park visitation numbers, in conjunction with the general decline in nesting success on Morro Strand and Villa Creek Beach, poses a threat to nesting WSP on these beaches.

A total of 715 public contacts were made by WSP monitors in the field with at least 1,288 visitors. Rangers contacted at least another 47 individuals for various violations on WSP breeding beaches. Formal interpretation was done on five separate occasions throughout the year to groups of varying sizes and formats.

Habitat enhancement through restoration and eradication of non-native plant species continues to be done on most District beaches. Though WSP are not the sole reason for these efforts, they do benefit from them due to suitable nesting habitat being restored.

Funding for the 2020 WSP season was provided by CSP Natural Resources Maintenance funding, MDO mitigation funds, District Home Base funding, and a USFWS predator control grant. Approximately $112,000 was spent on the WSP program this season. This amount does not include the WSP Program Coordinator’s time.

Future Management

The District will continue to manage the WSP program to ensure that District activities avoid negative impacts to WSP. The District will continue to monitor the population of breeding WSP and seek ways to provide long-term protection of this species and its habitat. The District will continue to develop the WSP program in coordination with the USFWS and CDFW and seek to further recovery goals and objectives as identified by the USFWS for Recovery Unit 5 where feasible. The following, in non-prioritized order, are management actions proposed for the District WSP program:

1. Continue to monitor during the breeding and non-breeding seasons.

    a. Maintain a core of permitted monitors who possess field experience within the District.

    b. Manage for the protection of nesting and wintering habitat for WSP and other shorebirds.

2. Continue to install symbolic fencing and signage along WSP nesting habitat to keep recreation out of closed areas and control access points during the breeding season.

    a. Install brightly colored WSP signs at the access corridors on District beaches to make the corridors more visible.

3. Move towards fulfilling USFWS WSP Recovery Plan management recommendations including but not limited to Pacific Coast Population Recovery Plan Recovery Actions 1.1, 1.2, 1.3, 1.4, 1.6, 2.2, 2.3, 2.4, 5.1, 5.2, 5.3, 5.4, 5.5, & 5.6 (USFWS 2007).

4. Secure permanent funding for the District WSP program.

5. Secure funding for on on-going predator management control actions to remove problematic species.

    a. Utilize wildlife cameras at appropriate locations to determine target species responsible for depredations of nests and adult WSP.

    b. Provide training to monitors on how to operate wildlife cameras near WSP nests with minimal disturbance to WSP.

6. Consider management options other than exclosures to increase hatching success.

7. Review current monitoring methods and consider ways to use electronic forms in the field to increase efficiency, reduce paper use, and minimize redundancy of transmitting data from paper to electronic format.

8. Provide annual WSP training for CSP staff and volunteers.

9. Continue cooperation with agencies and others using vehicles on the beach to keep vehicle use on wet sand, at a slow speed, and as infrequent as possible for the protection of breeding and wintering WSP and other shorebirds.

10. Continue involvement with range-wide and Recovery Unit 5 recovery efforts for the WSP.

11. Include CSP Ranger staff in regularly-scheduled WSP meetings to increase communication and coordination within the District for achieving our WSP recovery potential.

12. Contact other CSP with WSP programs to learn about how other programs are managed and monitored.

13. Enforce CSP regulations that benefit WSP and its habitat throughout the year.

    a. Daily vehicle patrols by CSP Ranger staff to enforce rules and regulations affecting WSP habitat (i.e., dogs on beach, illegal fires, people trespassing inside closed nesting habitat, and kite/drone flying).

14. Continue non-native plant removal program to create more WSP habitat.

15. Investigate remedies with the City for the removal of American crows from Morro Strand.

16. Develop an outreach and education program with CSP Interpretive Program.

17. Maintain communications with Morro Bay High School regarding beach use restrictions and project objectives during the WSP breeding season.

18. Increase staff and volunteer presence on July 4th to prevent disturbance to nesting WSP and to educate visitors.

19. Continue temporary installation of "no dog" signs close to the mean high tide line at the southern and northern boundaries of Morro Strand to inform dog owners that dogs are not allowed past this point.

20. Mark corridors on the east side (bayside) of the Sandspit using easily visible flags, and erecting signage with directions to the nearest corridor at popular kayak landing areas. Continue to provide accurate maps of corridor locations to local kayak rental businesses.

21. Partner with the City in assisting them with their fence installation and removal.

22. Complete the Predator Management Plan for the District.

23. Expand the volunteer outreach program to target beach users before they enter the beach.

References Cited

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California State Parks, San Luis Obispo Coast District. December 2019. Western Snowy Plover Management Plan. Unpublished document. 8 pages + appendices.

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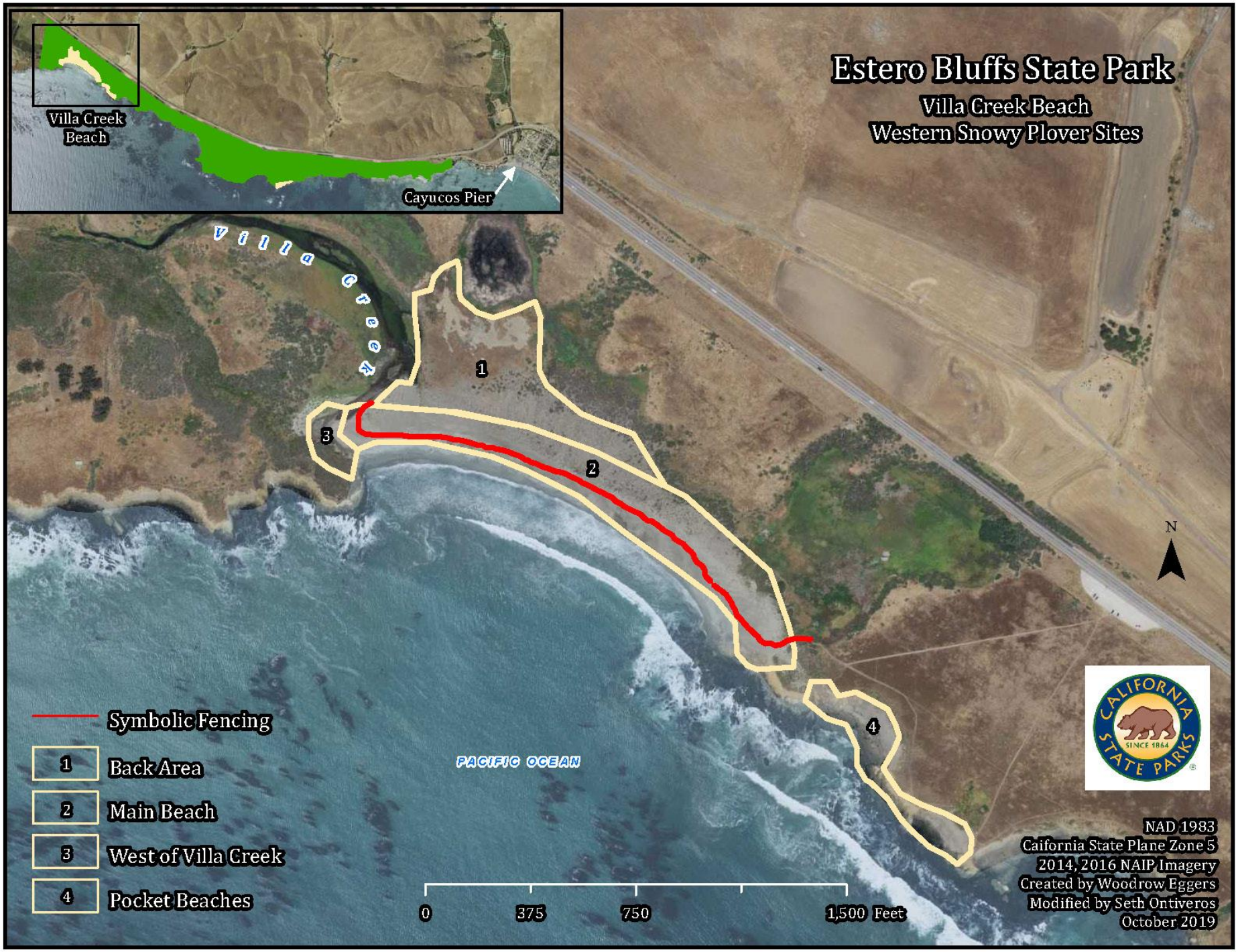
District Beaches Overview
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
San Carpoforo Creek Beach
Point Sierra Nevada
Arroyo de la Cruz
Sidney's Lagoon
Piedras Blancas
Arroyo Laguna
San Simeon Creek Beach
Santa Rosa Creek Beach
Villa Creek Beach
Cayucos Pier
Old Creek
Morro Strand
Sandspit
HEARST SAN SIMEON STATE PARK
San Simeon
Cambria
ESTERO BLUFFS STATE PARK
Cayucos
Morro Bay
MORRO STRAND STATE BEACH
Baywood - Los Osos
MONTAÑA DE ORO STATE PARK
PACIFIC
OCEAN
San Luis Obispo Coast District
Western Snowy Plover Sites
N
0 5 10 15 20 Miles
CSP Properties
Populated Areas
NAD 1983
California State Plane Zone 5
Created by Woodrow Eggers
October 2017

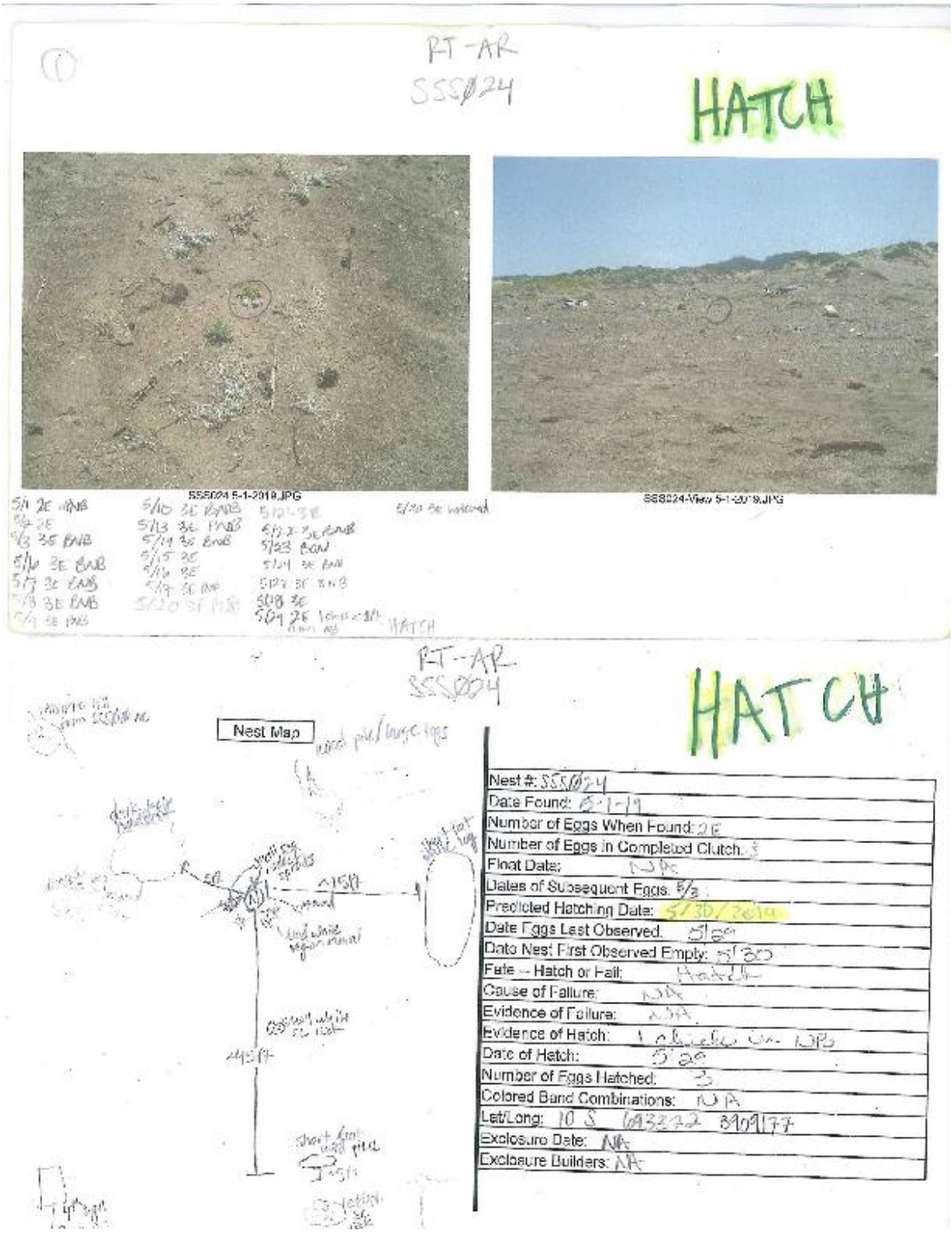

Estero Bluffs State Park
Villa Creek Beach
Western Snowy Plover Sites
Villa Creek Beach
Cayucos Pier
Villa Creek
1
2
3
4
N
PACIFIC OCEAN
Symbolic Fencing
1 Back Area
2 Main Beach
3 West of Villa Creek
4 Pocket Beaches
0
375
750
1,500 Feet
NAD 1983
California State Plane Zone 5
2014, 2016 NAIP Imagery
Created by Woodrow Eggers
Modified by Seth Ontiveros
October 2019


Morro Strand State Beach
Western Snowy Plover Sites
Southern Unit (Morro Strand)
Old Creek
Morro Strand
State Beach
PACIFIC
OCEAN
1
2
3
4
Symbolic Fencing
1 Campground-Hatteras
2 Hatteras-Azure
3 Azure-Boardwalk
4 Boardwalk-41
0 750 1,500 3,000 Feet
NAD 1983
California State Plane Zone 5
2005, 2014 NAIP Imagery
Created by Seth Ontiveros
October 2019


Montaña de Oro State Park
Western Snowy Plover Sites
Sandspit
State Park Boundary
Rescue Marker 6
State Park Corridor
Rescue Marker 5
Rescue Marker 4
Rocky Mounds
Rescue Marker 3
Rescue Marker 2
Sharks Inlet Corridor
Rescue Marker 1
Army Road
Rim Trail
Sandspit Trail
American Canyon Trail
Cables Trail
N
Nest Exclosures
Symbolic Fencing
0
0.25
0.5
1 Mile
CALIFORNIA STATE PARKS SINCE 1864
NAD 1983
California State Plane Zone 5
ESRI World Imagery
Created by Seth Ontiveros
October 2019

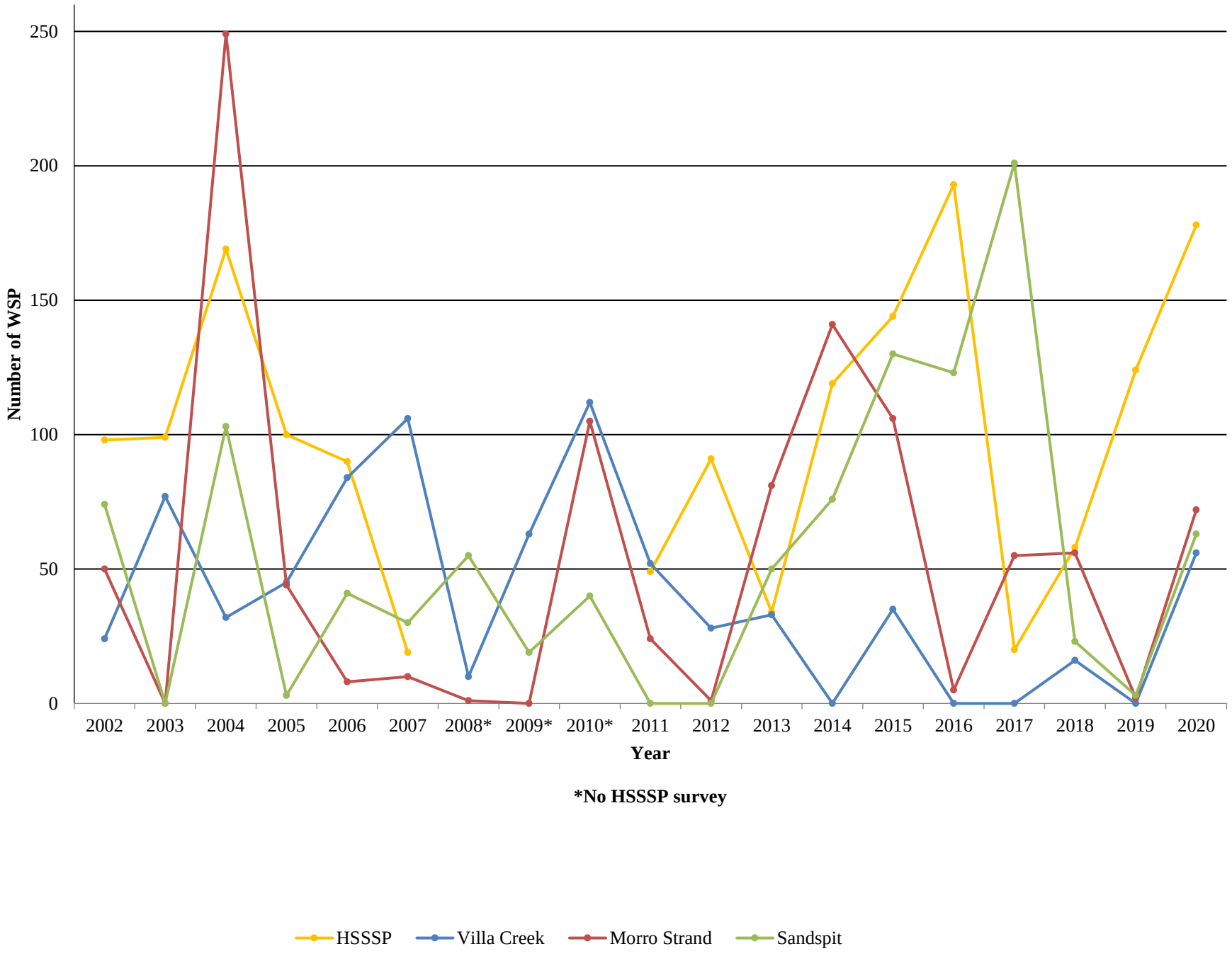
Appendix 2 – Nest Card Example

Nest card from nest number SSS024 on the south half of the Sandspit between Rim Trail and Army Road.

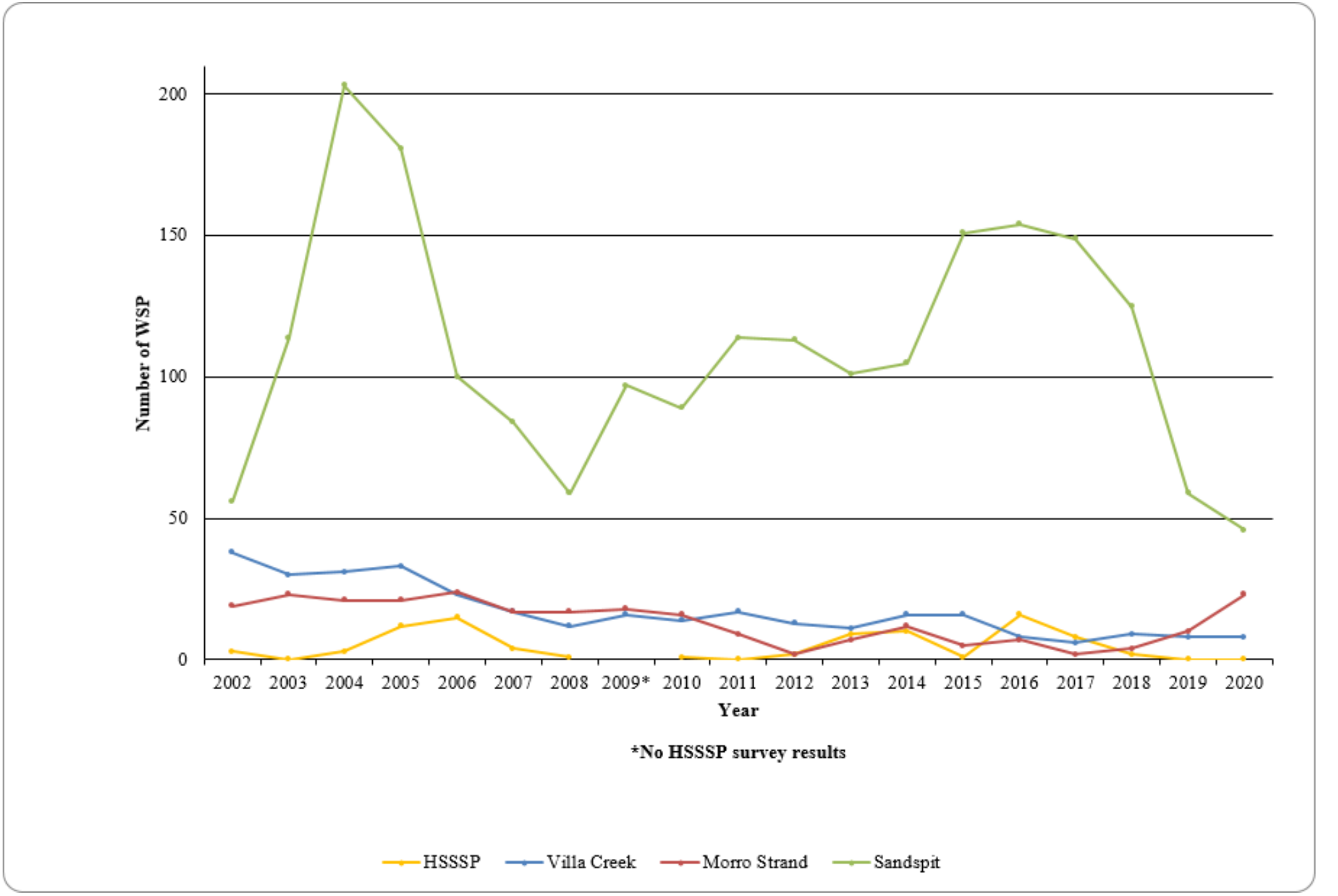


E=egg; BNB= Bird nearby; BON=Bird on nest; BWD=Broken wing display; NB=nest bow

Appendix 3 – Winter Window Survey Results on District Beaches 2002-2020



Appendix 4 – Breeding Window Survey Results on District Beaches 2002-2020



Appendix 5 - Banded WSP with Known Origins Observed on District Beaches October 2019 - February 2020

Band Combination	Sex	First Seen	Last Seen	# Times Seen	History	Location	Notes
an:oo	J	10/01/19	10/22/19	2	VAFB '19	Sandspit	
an:ww	U	10/29/19	01/22/20	5	VAFB '15	San Carpoforo Creek Beach, Arroyo de la Cruz, Morro Strand	
ay:aa	M	10/01/19	10/01/19	1	Marina SB '14	Sandspit	
b/a/b:g	F	10/01/19	02/05/20	7	Oregon '15	Sandspit	
b:ao	J	10/01/19	12/05/19	5	ODSVRA '19	Sandspit	
bb:ar	F	10/01/19	02/18/20	14	ODSVRA '18	Villa Creek Beach	
bb:go	J	11/26/19	11/26/19	1	ODSVRA '19	Sandspit	
Bg:yr	M	10/08/19	01/07/20	4	Zmudowski SB '19	Sandspit	Banded as an adult
by:oa	U	12/10/19	01/03/20	2	Salinas NWR '14	Santa Rosa Creek Beach	
By:rb	M	12/06/19	01/21/20	3	Marina SB '15	Morro Strand, Sandspit	Banded as an adult; B peeling to silver
g/b:b	M	10/01/19	02/18/20	8	Oregon '19	Sandspit	
ga:pb	M	11/12/19	02/18/20	5	ODSVRA '16 or '17	San Carpoforo Creek Beach	
gg:ar	M	12/31/19	01/22/20	2	ODSVRA '11	San Carpoforo Creek Beach	
gg:oa	U	10/29/19	02/23/20	14	ODSVRA '19	Villa Creek Beach, Morro Strand	
gg:og	M	10/01/19	11/19/19	6	ODSVRA '14	Sandspit	
gg:pb	F	10/01/19	02/08/20	10	ODSVRA '12	Arroyo Laguna, San Simeon Creek Beach, Santa Rosa Creek Beach	
gg:pr	U	10/29/19	02/06/20	4	ODSVRA '16	Arroyo Laguna, Santa Rosa Creek Beach	
gg:yb	U	10/29/19	01/29/20	8	ODSVRA '19	Arroyo Laguna, Santa Rosa Creek Beach, Morro Strand	

go:gb	M	10/06/19	12/10/19	4	Fort Ord Dunes SP '15	Arroyo Laguna	
no:yo	F	10/29/19	02/18/20	7	VAFB '19	San Carpoforo Creek Beach, Arroyo de la Cruz	
oa:ya	M	10/01/19	01/28/20	7	Pajaro Spit '14	Morro Strand, Sandspit	
ow:wr	F	10/01/19	02/23/20	20	Fort Ord Dunes SP '15	Villa Creek Beach	
oy:aa	M	10/01/19	02/18/20	24	Salinas River SB '18	Villa Creek Beach	
Oy:br	M	10/01/19	02/11/20	9	Fort Ord Dunes SP '16	Sandspit	Banded as an adult
oy:gv	F	10/01/19	02/05/20	7	Marina SB '17	Morro Strand, Sandspit	
pg:ag	U	10/01/19	02/18/20	7	ODSVRA '19	Morro Strand, Sandspit	
pv:gw	U	10/06/19	10/06/19	1	ODSVRA '17	Arroyo Laguna	
pv:gy	U	10/29/19	02/29/20	10	ODSVRA '18	San Simeon Creek Beach, Santa Rosa Creek Beach	
rb:bg	M	10/01/19	02/05/20	5	Fort Ord Dunes SP '15	Sandspit	
rr:ag	M	10/01/19	01/14/20	6	ODSVRA '17	Morro Strand, Sandspit	
Rw:br	M	10/29/19	02/06/20	6	Zmudowski SB '09	San Carpoforo Creek Beach	Banded as an adult
vg:ar	M	10/15/19	02/18/20	5	ODSVRA '18	San Carpoforo Creek Beach	
vg:wv	J	11/19/19	12/17/19	2	ODSVRA '19	Morro Strand	
vv:gw	F	10/29/19	01/03/20	4	ODSVRA '15	Arroyo Laguna, San Simeon Creek Beach	
wb:ra	U	10/29/19	01/28/20	7	Pajaro Spit '18	Arroyo Laguna, Santa Rosa Creek Beach	
y/r:b	U	12/17/19	01/14/20	3	Oregon '19	Morro Strand, Sandspit	
u:or	F	10/01/19	02/05/20	7	VAFB '13	Morro Strand	Formerly nb:or
u:rl	F	10/01/19	02/11/20	11	Fort Ord Dunes SP '16	Villa Creek Beach, Morro Strand	Formerly oy:rl

Band Combination	Sex	First Seen	Last Seen	# Times Seen	History	Location	Notes
a:Rs	M	04/29/20	09/03/20	37	Baja CA Mexico '19	Morro Strand, Sandspit	Red flag w/white R3; one confirmed nest failed to unknown predator at Morro Strand
an:pr	J	08/03/20	08/06/20	2	VAFB '20	Arroyo Laguna	
ao:bg	F	04/07/20	08/01/20	18	Coronado NAS Sea World '18	Sandspit	One potential nest failed to unknown avian predator
ao:gb	M	04/10/20	05/26/20	17	Coronado NAS Sea World '18	Morro Strand	One potential nest failed to unknown predator
ao:po	U	05/22/20	05/23/20	2	Coronado NAS Sea World '19	Morro Strand	
ay:aa	M	03/16/20	05/15/20	15	Marina SB '14	Sandspit	One potential nest failed to American crow and one potential nest failed to unknown avian predator
b/a/b:g	F	07/25/20	09/22/20	10	Oregon '15	Sandspit	
bb:ag	J	06/27/20	08/12/20	5	ODSVRA '20	Morro Strand, Sandspit	
bb:ar	F	03/02/20	09/28/20	31	ODSVRA '18	Villa Creek Beach, Morro Strand, Sandspit	
bb:bo	J	09/03/20	09/22/20	2	ODSVRA '20	Sandspit	
bb:ga	M	04/17/20	05/08/20	7	ODSVRA '19	Morro Strand	
bb:wg	J	07/14/20	07/14/20	1	ODSVRA '20	Sandspit	
bb:ww	J	08/01/20	08/06/20	3	ODSVRA '20	Morro Strand	
Bg:yr	M	03/03/20	09/28/20	27	Zmudowski SB '19	Sandspit	Banded as an adult
g/b:b	M	03/13/20	04/13/20	9	Oregon '19	Sandspit	
g/y:y	J	09/17/20	09/17/20	1	Oregon '20	Point Sierra Nevada	
ga:av	J	09/11/20	09/11/20	1	ODSVRA '20	Sandspit	
ga:ba	J	08/13/20	08/18/20	3	ODSVRA '20	Arroyo Laguna, Morro Strand	Two banded with this combination

ga:by	J	08/04/20	09/01/20	8	ODSVRA '20	Arroyo Laguna, Morro Strand, Sandspit	Two banded with this combination
ga:pv	J	09/08/20	09/24/20	3	ODSVRA '20	Sandspit	
gg:oa	F	03/02/20	09/28/20	53	ODSVRA '19	Villa Creek Beach, Sandspit	
gg:ob	U	03/02/20	03/03/20	2	ODSVRA '19	Morro Strand	
gg:pb	F	03/03/20	09/22/20	39	ODSVRA '12	Arroyo Laguna, Sandspit	
gg:pr	U	08/03/20	08/06/20	2	ODSVRA '16	Arroyo Laguna	Captured 08/06/20 to have bands removed due to swollen left foot; released without bands on 08/18/20; missing tips of two digits on left foot
gg:yb	U	03/26/20	04/09/20	2	ODSVRA '19	Arroyo Laguna	
gn:ww	J	08/03/20	08/11/20	4	VAFB '20	Morro Strand	
go:gb	M	08/01/20	09/22/20	11	Fort Ord Dunes SP '15	Arroyo Laguna, Morro Strand	
gv:ow	U	04/09/20	04/09/20	1	Humboldt Bay '18	Arroyo Laguna	
no:no	U	06/02/20	06/02/20	1	VAFB '19	Morro Strand	
no:yo	F	03/12/20	04/30/20	5	VAFB '19	San Carpoforo Creek Beach	
no:yy	J	08/08/20	08/08/20	1	VAFB '20	Morro Strand	
nw:yy	J	07/27/20	07/28/20	2	VAFB '20	Morro Strand, Sandspit	
ny:oy	J	08/11/20	08/13/20	2	VAFB '20	Arroyo Laguna	
ny:wl	J	08/17/20	08/17/20	1	VAFB '20	Morro Strand	
ny:yg	M	05/04/20	05/04/20	1	VAFB '19	Morro Strand	
o/l:v	J	09/22/20	09/22/20	1	Oregon '20	Santa Rosa Creek Beach	
oa:ya	M	03/13/20	09/24/20	51	Pajaro Spit '14	Morro Strand, Sandspit	Two confirmed nests and one potential nest at the Sandspit; one confirmed nest hatched and produced one fledgling; the second confirmed nest failed to unknown corvid; one potential nest failed to coyote

ow:wr	F	03/02/20	09/22/20	80	Fort Ord Dunes SP '15	Villa Creek Beach, Morro Strand	Two confirmed nests hatched at Villa Creek Beach; two fledglings produced from one of these nests
Oy:u	M	08/07/20	09/24/20	12	Fort Ord Dunes SP '16	Sandspit	Formerly Oy:br; banded as an adult; missing digit on right foot
oy:aa	M	03/02/20	09/22/20	117	Salinas River SB '18	Villa Creek Beach	Three confirmed nests and one potential nest; one confirmed nest hatched and produced one fledgling; one confirmed nest failed to American crow; one confirmed nest failed to unknown avian predator; one potential nest failed to unknown corvid
pg:ag	U	03/05/20	04/03/20	9	ODSVRA '19	Sandspit	
pv:gb	J	09/17/20	09/24/20	3	ODSVRA '20	Arroyo Laguna, Sandspit	Three banded with this combination
pv:gy	U	03/05/20	09/22/20	6	ODSVRA '18	San Simeon Creek Beach, Santa Rosa Creek Beach	
r/v/r:y	J	09/22/20	09/22/20	1	Oregon '20	Arroyo Laguna	
r/w/r:y	J	09/17/20	09/24/20	2	Oregon '20	Sandspit	
rb:bg	M	03/06/20	09/24/20	41	Fort Ord Dunes SP '15	Morro Strand, Sandspit	One confirmed nest hatched at the Sandspit; one potential nest failed to unknown predator at the Sandspit
rr:ag	M	07/08/20	09/01/20	18	ODSVRA '17	Morro Strand	
Rw:br	M	03/05/20	04/02/20	4	Zmudowski SB '09	San Carpoforo Creek Beach	Banded as an adult
v/g/v:y	J	09/11/20	09/11/20	1	Oregon '20	Sandspit	
vg:ab	J	07/31/20	08/05/20	3	ODSVRA '20	Santa Rosa Creek Beach, Morro Strand, Sandspit	
vg:ar	M	03/19/20	04/02/20	4	ODSVRA '18	San Carpoforo Creek Beach, Point Sierra Nevada	
vg:av	U	08/04/20	08/04/20	1	ODSVRA '19	Morro Strand	
vg:ya	J	08/24/20	09/10/20	4	ODSVRA '20	Morro Strand	

vv:gw	F	08/03/20	09/22/20	11	ODSVRA '15	Arroyo Laguna, Morro Strand	
vv:or	M	03/04/20	08/02/20	50	ODSVRA '15	Morro Strand, Sandspit	Two confirmed nests failed at Morro Strand; one failed to striped skunk and one failed to American crow; one additional potential nest at Morro Strand failed to American crow; paired with u:or for one of the confirmed nests and the potential nest
vv:ra	J	08/18/20	09/23/20	5	ODSVRA '20	Morro Strand, Sandspit	
vv:rv	J	08/04/20	08/08/20	3	ODSVRA '20	Morro Strand	
vv:vo	J	08/03/20	08/06/20	4	ODSVRA '20	Morro Strand	
wg:ab	M	03/17/20	09/01/20	53	Fort Ord Dunes SP '19	Morro Strand, Sandspit	Two potential nests at Morro Strand; one failed to red fox and one failed to striped skunk
wy:by	J	08/19/20	08/26/20	3	Pajaro Spit '20	Sandspit	
yr:ao	J	08/12/20	08/13/20	2	Pajaro Spit '20	Sandspit	
u:or	F	03/02/20	09/24/20	36	VAFB '13	Villa Creek Beach, Morro Strand, Sandspit	Formerly nb:or; r appears as s/r/s; one confirmed nest at Morro Strand paired with vv:or failed to striped skunk; one potential nest at Morro Strand paired with vv:or failed to American crow; one confirmed nest at the Sandspit failed to coyote
u:rl	F	05/30/20	09/24/20	31	Fort Ord Dunes SP '16	Villa Creek Beach, Morro Strand	Formerly oy:rl; lump on left leg; one confirmed nest at Morro Strand failed to striped skunk

Appendix 7 - Injured and Dead WSP on District Beaches October 2019 - September 2020

Date	Location	Sex	Age	Band Combination	Nest	Description of Injury	Actions Taken	Comments
10/01/19	Villa Creek Beach, Morro Strand	F	Adult	u:rl	MS31	Bump on unbanded left leg; noticed not using right leg on 08/11/20	Photographed and notified USFWS; Doug George attempted to capture three times	Previously oy:rl; Doug George removed oy bands on 09/26/19; observed 42 times; 15 of those at Villa Creek Beach and 27 at Morro Strand from 10/01/19 until 09/24/20; observed six times at Morro Strand not using its right leg; observed eight times at both Villa Creek Beach and Morro Strand running with both legs and not limping after not using the right leg; one confirmed nest failed at Morro Strand to striped skunk
10/01/19	Villa Creek Beach	F	Adult	None		Missing right foot	None	Foraged and moved fine; observed 19 more times through 09/22/20
10/29/19	San Simeon Creek Beach	U	Unknown	None		Left leg held up	Photographed	Did not use left leg at all
11/12/19	San Carpoforo Creek Beach	U	Unknown	None		Right leg held up and darker	None	Never put leg down while running
01/02/20	Santa Rosa Creek Beach	U	Adult	None		Dead	Photographs taken and collected; sent to CDFW Marine Wildlife Veterinary Care and Research Center for necropsy with USFWS permission	Found by Elizabeth Bettenhausen on beach with hole between cloaca and right leg; cause of death was acute trauma possibly from a predator
01/21/20	Morro Strand	U	Adult	None		Right leg held up; appeared to have fishing line attached to right leg	Notified USFWS and Doug George; Doug George looked for bird on 01/22/20 but did not find	

Appendix 7 - Injured and Dead WSP on District Beaches October 2019 - September 2020

Date	Location	Sex	Age	Band Combination	Nest	Description of Injury	Actions Taken	Comments
01/22/20	Morro Strand, Sandspit	U	Adult	None		Held right leg up with toes dangling and leg appeared oriented in wrong direction; after several months, the leg began to jut out to the side	Assessed in the field by Doug George; determined no evidence suggesting human caused injury; notified USFWS	Observed 44 times at Morro Strand and five times at the Sandspit from 01/22/20 through 09/24/20; different bird than the one with fishing line based on comparitive photos; Doug George decided not to attempt capture
02/05/20	Morro Strand	U	Adult	None		Found dead on beach	None	Carcass highly scavenged/decomposed
03/02/20	Morro Strand	U	Adult	None		Missing right foot	None	Moved fine
04/21/20	Morro Strand	F	Adult	None		Missing most of right leg	None	Moved and foraged fine
07/04/20	Sandspit	U	Juvenile	None		Right wing drooping	None	Foraging fine; observed one short flight
07/06/20	Sandspit	U	Adult	None	NSS036	Partial wing	Collected	Probable WSP wing found 15 feet from exclosed nest; nest was later determined to be abandoned
08/03/20	Arroyo Laguna	U	Adult	gg:pr		Left leg held up, foot swollen	Photographs taken; notified USFWS; Doug George captured and took to PWC on 08/06/20; placed on antibiotics; released at Arroyo Laguna with all bands removed on 08/18/20	No obvious cause for holding foot up; PWC determined only abnormality was thickened, retained skin on left foot which caused constriction to the end of two digits; the tips of the two digits sloughed off
08/07/20	Sandspit	M	Adult	Oy:u		Missing toe on right foot	None	Formerly Oy:br; right bands removed on breeding grounds in 2020; moved fine; observed 12 times from 08/07/20 through 09/24/20

Date	Location	Sex	Age	Band Combination	Nest	Description of Injury	Actions Taken	Comments
08/25/20	Morro Strand	U	Unknown	None		Left foot curled under when standing; held right leg up almost entire time observed	None	Stumbled occasionally; flew fine; observed one more time on 08/28/20

Appendix 8 – 2020 Floated Egg Data for District Beaches

Nest #	Float Data	Float Date	Estimated # of Days Before Hatching	Estimated Hatch Date	Actual # of Days Before Hatching	Actual Hatch Date	Cause of Failed Nests	Date Failure	# of Days Before Failing	Floated By
Morro Strand										
MS30	40°, 45°, 60°	06/22/20	20	07/12/20			Striped Skunk	06/24/20	2	S Ontiveros
MS31	0°, 5°, 10°	06/22/20	28	07/20/20			Striped Skunk	07/03/20	11	S Ontiveros
Sandspit										
North										
NSS001	35°, 35°, 40°	03/25/20	24	04/18/20			Unknown Corvid	04/14/20	20	R Orr
NSS005	30°, 30°, 40°	03/30/20	26	04/25/20			Unknown Corvid	04/14/20	15	R Orr
NSS031	7 mm, 11mm, 12mm	06/01/20	12	06/13/20	8	06/09/20				S Ontiveros
NSS032	40°, 60°, 80°	06/01/20	21	06/22/20			Wind	06/08/20	7	S Ontiveros
NSS033	90°, 12 mm, 13 mm	06/03/20	16	06/19/20	12	06/15/20				R Orr
NSS036	30°, 50°, 50°	06/18/20	25	07/13/20			Abandoned	07/08/20	20	R Orr
South										
SSS023	80°, 90°, 90°	05/20/20	18	06/07/20	19	06/08/20				R Orr
SSS028	20°, 20°, 30°	06/03/20	27	06/30/20	26	06/29/20				R Orr
SSS029	50°, 70°, 80°	06/04/20	20	06/24/20	20	06/24/20				R Orr
SSS044	15 mm, 17 mm	07/08/20	5	07/13/20	6	07/14/20				R Orr
SSS052	80°, 80°, 90°	07/10/20	19	07/29/20	20	07/30/20				S Ontiveros
SSS053	80°, 90°, 90°	07/10/20	18	07/28/20	17	07/27/20				S Ontiveros

NOTES

Value with degree symbol (°) indicates angle at which egg floats, given horizontal = 0° and vertical = 90°.

Value with millimeter symbol (mm) indicates diameter of egg visible above surface of wate

Appendix 9 – WSP Population Census Data on District Beaches October 2019 – September 2020

Date	*San Carpoforo Creek Beach*	*Point Sierra Nevada*	*Arroyo de la Cruz*	*Sidney's Lagoon*	*Piedras Blancas*	*Arroyo Laguna*	*San Simeon Creek Beach*	*Santa Rosa Creek Beach*	**Hearst San Simeon State Park Total**
10/01/19	0	0	0	6	0	22	0	11	**39**
10/07/19	-	-	-	-	-	47	-	-	**47**
10/09/19	20	0	0	14	0	0	0	21	**55**
10/15/19	27	0	0	15	0	1	20	18	**81**
10/22/19	18	0	0	2	0	3	11	28	**62**
10/29/19	19	1	32	0	0	47	34	18	**151**
11/05/19	16	0	0	5	0	28	0	51	**100**
11/12/19	29	0	29	7	0	55	25	36	**181**
11/20/19	5	0	12	0	0	19	1	54	**91**
12/05/19	34	0	6	0	0	33	0	43	**116**
12/10/19	43	0	3	0	0	79	0	44	**169**
12/17/19	29	0	0	0	0	41	0	50	**120**
01/14/20[2]	57	0	0	0	0	0	0	121	**178**
01/22/20	59	0	0	0	0	22	0	41	**122**
01/29/20	58	0	0	0	0	0	0	107	**165**
02/06/20	57	0	0	0	0	2	1	64	**124**
02/11/20	40	-	0	0	-	0	0	105	**145**
02/18/20	58	0	0	0	0	0	0	21	**79**
03/26/20	29	0	0	2	0	30	0	27	**88**
04/23/20	3	0	0	0	0	3	0	0	**6**
05/19/20[3]	0	0	0	0	0	0	0	0	**0**
06/30/20	-	0	0	0	0	0	0	0	**0**
08/26/20	-	1	0	0	0	28	0	9	**38**
09/22/20	-	0	0	16	4	53	1	24	**98**

Date	**Villa Creek Beach Total**	Male	Female	Unknown	Juvenile	Chick	***Morro Srand North (Old Creek)***	***Morro Strand South***	**Morro Strand Total**	Male	Female	Unknown	Juvenile	Chick	**Sandspit Total** [1]	Male	Female	Unknown	Juvenile	Chick
10/01/19	**38**			38			**0**	**103**	**103**			103			**64**			64		
10/08/19	**28**			28			**0**	**71**	**71**			71			**32**			32		
10/09/19	**32**			32			-	-	-						-					
10/15/19	**36**			36			**0**	**85**	**85**			85			**60**			60		
10/22/19	**38**			38			**0**	**49**	**49**			49			**62**			62		
10/29/19	**39**			39			**0**	**65**	**65**			65			**20**			20		
11/04/19	**27**			27			**0**	**64**	**64**			64			-					
11/05/19	-						-	-	-						**10**			10		
11/12/19	**21**			21			**20**	**56**	**76**			76			**26**			26		
11/19/19	**17**			17			**0**	**78**	**78**			78			**53**			53		
11/26/19	**18**			18			**5**	**37**	**42**			42			**27**			27		
12/05/19	**12**			12			**0**	**133**	**133**			133			**29**			29		
12/10/19	**8**			8			**0**	**78**	**78**			78			**35**			35		
12/17/19	**39**			39			**0**	**76**	**76**			76			**29**			29		
01/07/20	**33**			33			**0**	**70**	**70**			70			**20**			20		
01/14/20[2]	**56**			56			**0**	**72**	**72**			72			**63**			63		
01/21/20	**24**			24			**0**	**164**	**164**			164			**61**			61		
01/28/20	**47**			47			**0**	**62**	**62**			62			**47**			47		
02/05/20	**33**			33			-	**70**	**70**			70			**36**			36		
02/11/20	**39**			39			**0**	**67**	**67**			67			**24**			24		
02/18/20	**28**			28			**0**	**70**	**70**			70			**10**			10		
03/24/20	**24**	10	12	2			-	**55**	**55**	28	27				**47**	24	22	1		
04/21/20	**7**	4	3				-	**30**	**30**	19	10	1			**65**	29	31	5		
05/12/20	**5**	2	3			1	-	**20**	**20**	9	8	3			**47**	21	25	1		
05/19/20[3]	**8**	4	4			2	-	**23**	**23**	10	10	3			**46**	24	22			
06/30/20	**7**	3	4			3	-	**28**	**28**	14	12		2		**45**	20	19	4	2	2
07/21/20	**11**	6	5			4	-	**49**	**49**	22	23		4		**36**	14	17	4	1	1
08/25/20	**12**	2	1	9			-	**140**	**140**	1	2	130	7		**39**	9		28	2	
09/22/20	**41**	1	1	39			-	**5**	**5**			5			**81**	6	1	71	3	

NOTES

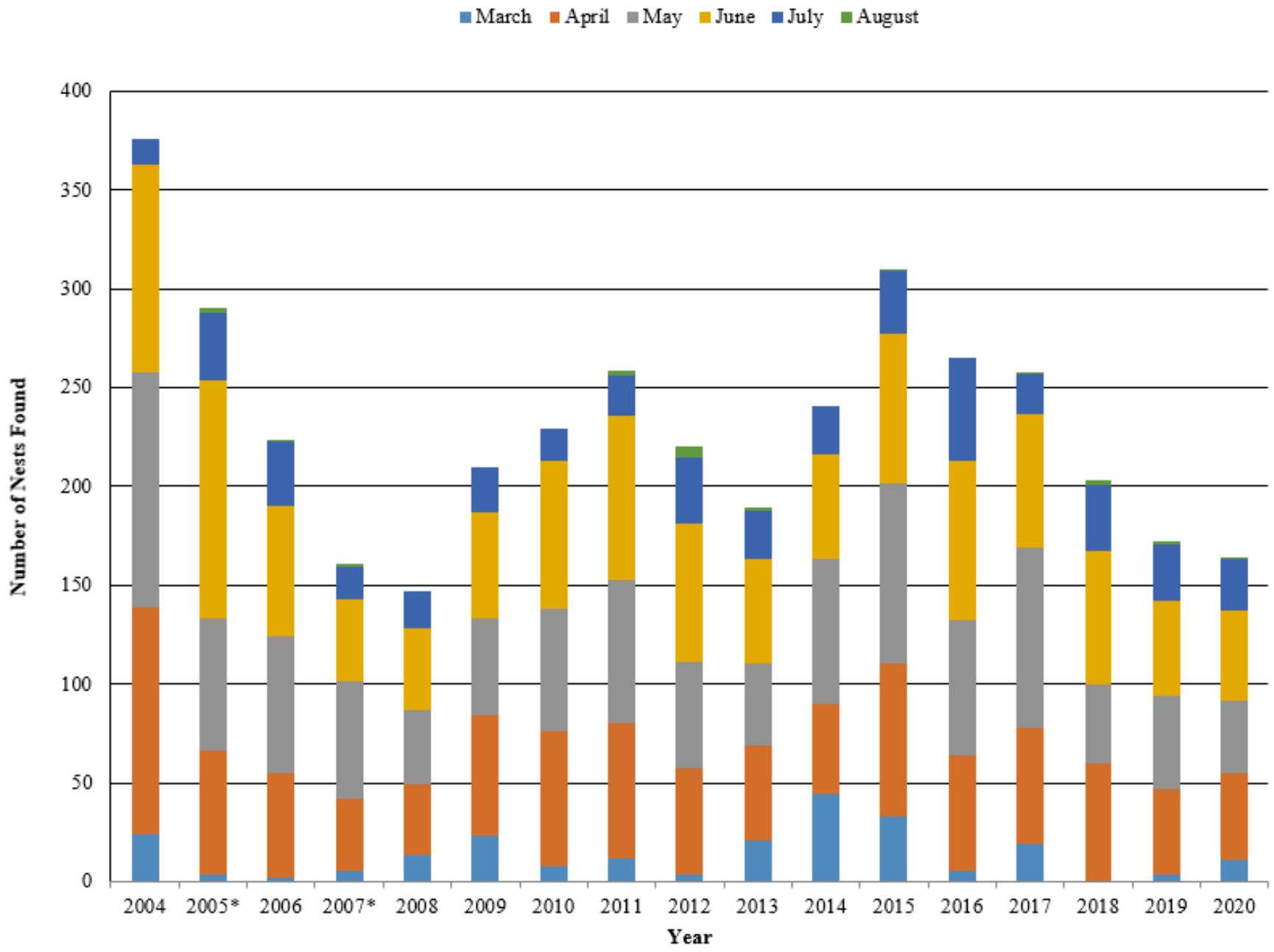
1. Sandspit data does not include City property
2. Winter window survey
3. Breeding window survey

" - " Indicates survey not conducted, while "0" indicates no WSP observed

= Indicates the change from winter surveys to breeding season surveys

HSSSP data not delineated by sex/age. Totals do not include chicks.

Appendix 10 - Number of Nests Found By Month On District Beaches 2004-2020



Appendix 10a - Nest Initiation and Last Hatch Dates Summary for District Beaches

Hearst San Simeon State Park		
Year	First Nest Initiation	Last Nest Hatched
2020	-	-
2019	-	-
2018	10-Apr*	-
2017	5-May	-
2016	11-May *	-
2015	21-Apr*	6-May*
2014	-	-
2013	-	-
2012	6-May*	5-Jun
2011	-	-
2010	-	-
2009	10-Apr	-
2008	-	-
2007	-	-
2006	26-Apr	11-Aug
2005	21-Apr	15-Jul
2004	-	-
2002	29-Apr	26-May*

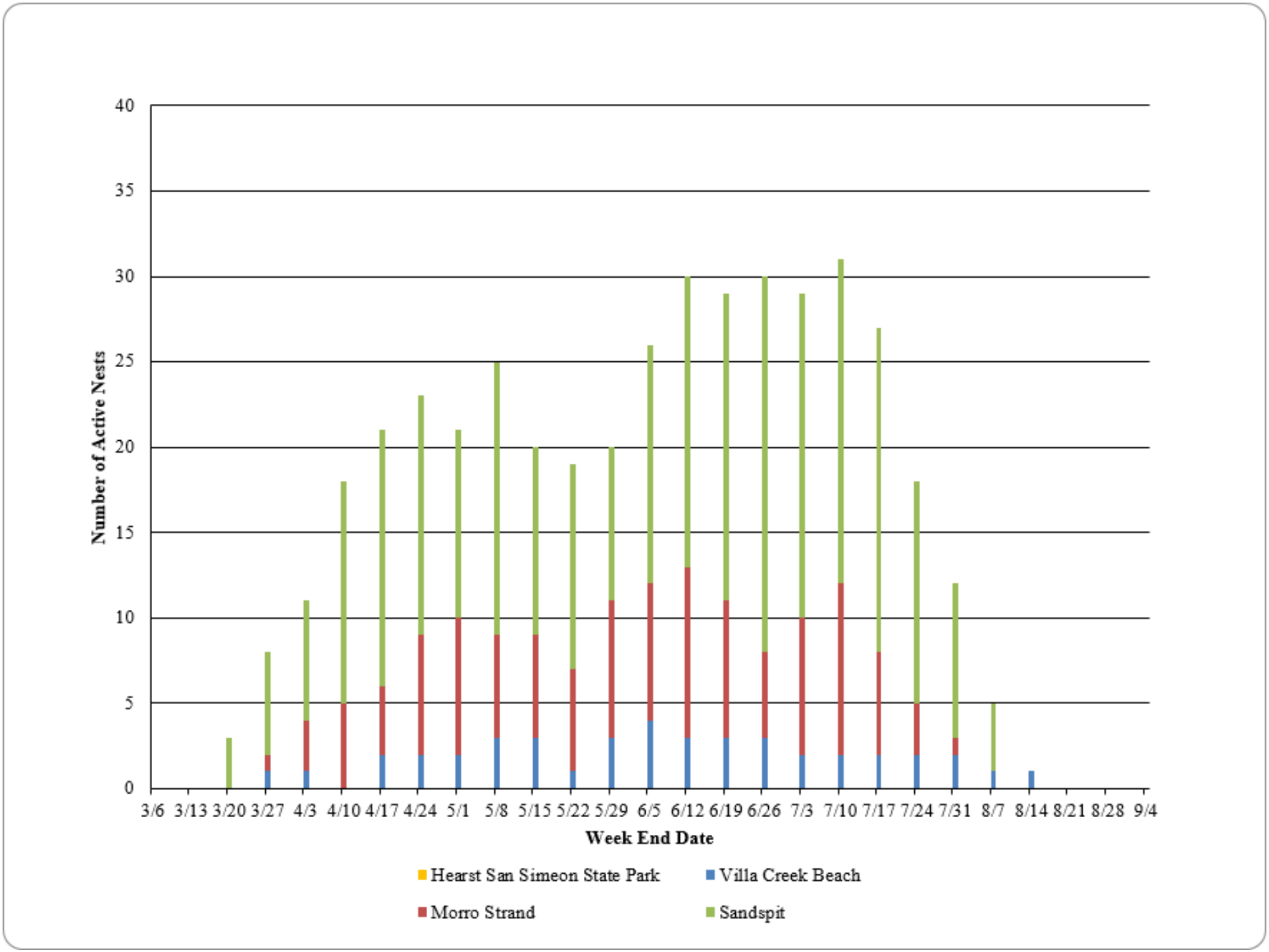
Villa Creek Beach		
Year	First Nest Initiation	Last Nest Hatched
2020	27-Mar	10-Aug
2019	27-Mar	2-Aug
2018	4-Apr*	10-Aug
2017	12-Apr	9-Aug
2016	13-Apr	14-Jul*
2015	25-Mar	22-Jul
2014	21-Mar	21-Jul*
2013	5-Apr	22-Jun
2012	9-Apr	14-Aug
2011	5-Apr	29-Jul
2010	31-Mar*	28-Jul
2009	9-Mar	29-Jun
2008	17-Mar	5-Aug
2007	9-Mar	1-Aug
2006	24-Mar	26-Jul
2005	30-Mar	22-Jul
2004	18-Mar	6-Aug
2003	21-Mar	31-Jul
2002	27-Mar	28-Aug
2001	28-Mar	30-Jul

*Approximate date

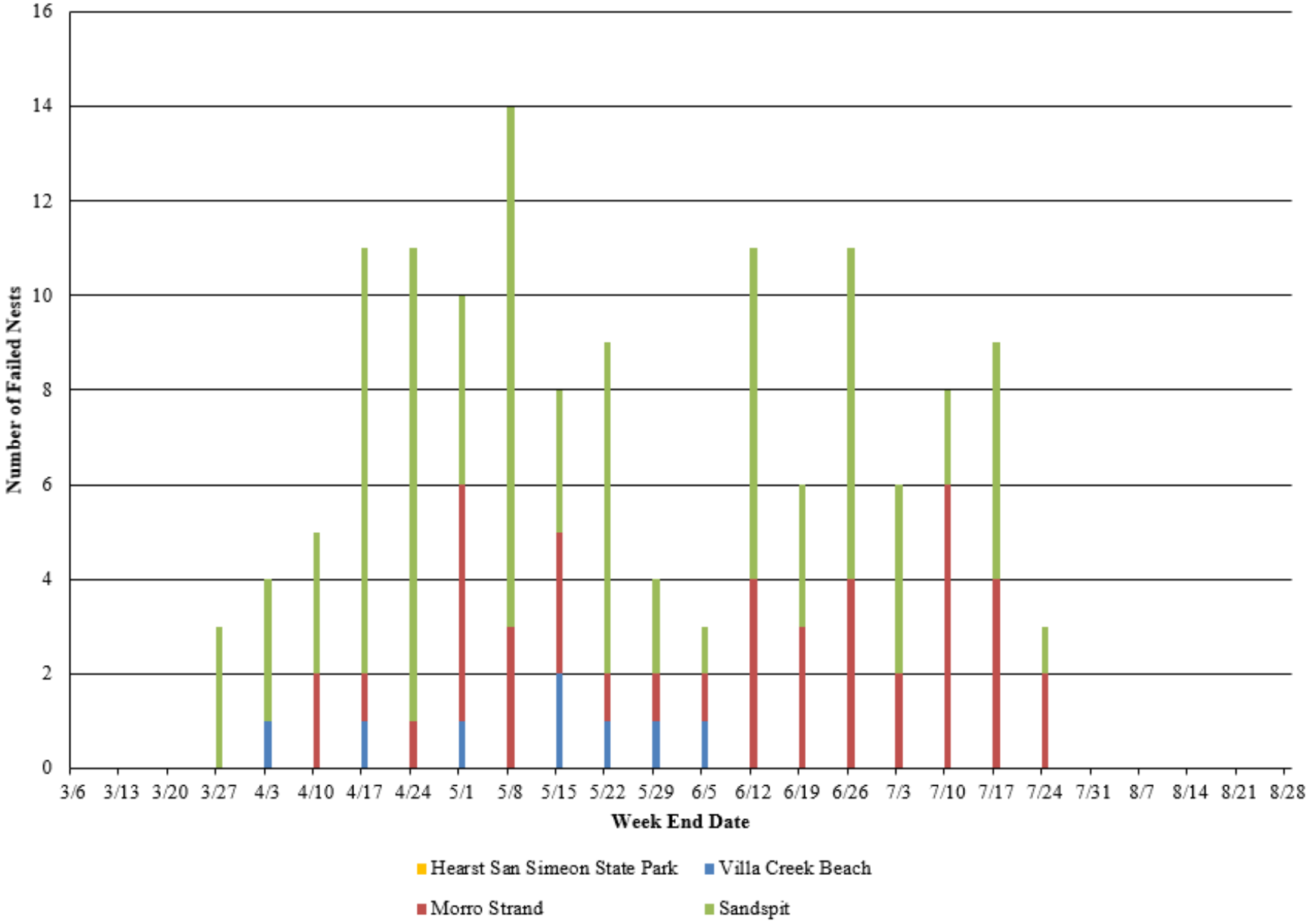
Morro Strand				Sandspit		
Year	First Nest Initiation	Last Nest Hatched		Year	First Nest Initiation	Last Nest Hatched
2020	27-Mar	-		2020	18-Mar*	7-Aug
2019	3-Apr	15-Jul		2019	26-Mar*	13-Aug*
2018	4-Apr	21-Aug		2018	2-Apr	20-Aug
2017	27-Mar	1-Aug		2017	15-Mar	8-Aug
2016	11-Apr	3-Aug		2016	28-Mar	13-Aug
2015	3-Apr	3-Aug		2015	13-Mar	24-Aug
2014	14-Mar	6-Aug		2014	12-Mar	18-Aug
2013	17-Apr	16-Aug*		2013	21-Mar	12-Aug
2012	18-Apr	7-Aug		2012	14-Mar	18-Aug
2011	16-Mar	15-Aug		2011	15-Mar	23-Aug
2010	9-Apr	16-Aug*		2010	19-Mar	8-Aug
2009	20-Mar	3-Aug		2009	9-Mar	17-Aug
2008	24-Mar	25-Jul		2008	18-Mar	18-Aug
2007	6-Apr	16-Aug		2007	21-Mar	20-Aug
2006	7-Apr	11-Aug		2006	7-Apr	15-Aug
2005	25-Apr	20-Aug*		2005	24-Mar	17-Aug
2004	18-Mar	18-Aug		2004	15-Mar	5-Aug
2003	21-Mar	14-Aug*		2003	16-Apr	11-Aug
2002	27-Mar	15-Jul		2002	28-Mar	8-Aug
2001	3-Apr*	13-Aug		2001	17-Mar	14-Aug
2000	28-Mar	3-Jun		2000	18-Mar	18-Aug
1997	13-Apr	20-Aug		1987	29-Mar	8-Aug*

*Approximate date

Appendix 10b - Number of Active Nests through Progressive Weeks of the 2020 Breeding Season



Appendix 10c - Number of Failed Nests through Progressive Weeks of the 2020 Breeding Season



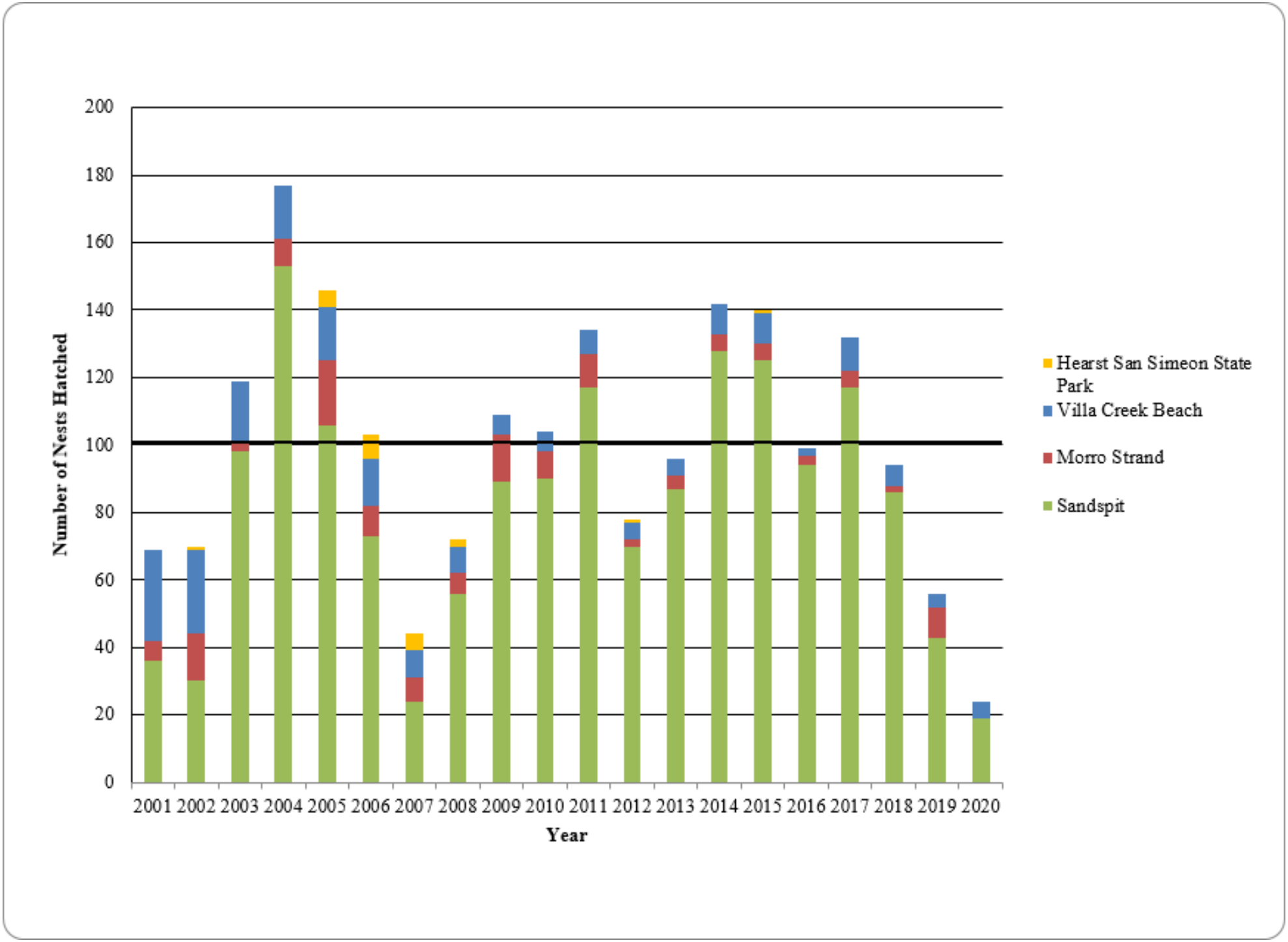
Appendix 10d - Summary of WSP Nest Fates at District Beaches 2001-2020

	2020		2019		2018		2017		2016		2015		2014		2013		2012		2011		2010		2009		2008		2007		#006		2005		2004 [1]		2003 [1]		2002 [1,2]		2001 [1,2]	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Hearst San Simeon State Park																																							
Total # of nests	0		0		1		2		1		1		0		0		3		0		0		2		2		6		11		5		0		1		1		N/A	
# Nests hatched	0		0		0		0		0		1	100%	0		0		1	33%	0		0		0		2	100%	5	83%	7	64%	5	100%	0		0		1	100%		
Failed predator	0		0		1	100%	1	100%	0		0		0		0		0		0		0		1	50%	0		0		0		0		0		1	100%	0			
Failed wind	0		0		0		0		0		0		0		0		0		0		0		1	50%	0		0		0		0		0		0		0			
Failed abandoned	0		0		0		0		0		0		0		0		2	67%	0		0		0		0		0		0		0		0		0		0			
Failed tide	0		0		0		0		0		0		0		0		0		0		0		0		0		1	17%	0		0		0		0		0			
Failed human	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Failed other	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Failed unknown	0		0		0		0		0		0		0		0		0		0		0		0		0		0		4	36%	0		0		0		0			
Unknown fate	0		0		0		1		1		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Villa Creek Beach																																							
Total # of nests	14		18		21		14		10		24		23		20		31		21		26		38		16		30		40		37		66		35		44		39	
# Nests hatched	5	36%	4	22%	6	29%	10	71%	2	22%	9	39%	9	39%	5	26%	5	16%	7	35%	6	23%	6	17%	8	57%	8	29%	14	36%	16	43%	16	24%	18	51%	25	57%	27	69%
Failed predator	9	64%	10	56%	10	48%	1	7%	5	56%	10	43%	9	39%	13	68%	24	77%	10	50%	13	50%	25	69%	3	21%	16	57%	21	54%	14	38%	29	44%	13	37%	8	18%	6	15%
Failed wind	0		0		0		0		0		0		2	9%	0		0		0		1	4%	1	3%	0		1	4%	0		0		0		0		0		0	
Failed abandoned	0		1	6%	4	19%	2	14%	2	22%	4	17%	1	4%	1	5%	1	3%	1	5%	4	15%	1	3%	1	7%	2	7%	2	5%	3	8%	4	6%	0		5	11%	1	3%
Failed tide	0		1	6%	0		1	7%	0		0		1	4%	0		0		2	10%	2	8%	2	6%	2	14%	1	4%	2	5%	4	11%	11	17%	0		2	5%	1	3%
Failed human	0		1	6%	0		0		0		0		1	4%	0		1	3%	0		0		1	3%	0		0		0		0		1	2%	0		0		3	8%
Failed other	0		0		1	5%	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	2%	0	
Failed unknown	0		1	6%	0		0		0		0		0		0		0		0		0		0		0		0		0		0		5	8%	4	11%	3	7%	1	3%
Unknown fate	0		0		0		0		1		1		0		1		0		1		0		2		2		2		1		0		0		0		0		0	
Morro Strand																																								
Total # of nests	44		18		12		16		16		13		17		12		12		25		24		26		33		19		34		27		38		45		37		14	
# Nests hatched	0		9	50%	2	18%	5	31%	3	19%	5	38%	5	31%	4	33%	2	17%	10	40%	8	35%	14	54%	6	19%	7	37%	9	27%	19	70%	8	21%	3	7%	14	38%	6	43%
Failed predator	40	91%	6	33%	8	73%	9	56%	10	63%	5	38%	3	19%	3	25%	6	50%	9	36%	6	26%	6	23%	8	26%	5	26%	2	6%	3	11%	14	37%	33	73%	8	22%	4	29%
Failed wind	2	5%	0		0		0		0		0		2	13%	2	17%	2	17%	3	12%	2	9%	1	4%	6	19%	1	5%	0		1	4%	3	8%	0		0		0	
Failed abandoned	2	5%	0		1	9%	1	6%	2	13%	1	8%	5	31%	3	25%	2	17%	2	8%	5	22%	3	12%	6	19%	6	32%	21	64%	3	11%	6	16%	1	2%	5	14%	0	
Failed tide	0		3	17%	0		0		0		1	8%	0		0		0		1	4%	2	9%	1	4%	4	13%	0		0		1	4%	2	5%	6	13%	1	3%	2	14%
Failed human	0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	3%	0		1	3%	0		0		0	
Failed other	0		0		0		0		0		1	8%	0		0		0		0		0		0		0		0		0		0		2	5%	0		0		0	
Failed unknown	0		0		0		1	6%	1	6%	0		1	6%	0		0		0		0		1	4%	1	3%	0		0		0		2	5%	2	4%	9	24%	2	14%
Unknown fate	0		0		1		0		0		0		1		0		0		0		1		0		2		0		1		0		0		0		0		0	
Sandspit																																								
Total # of nests	106		136		169		226		238		272		201		157		174		213		179		144		96		109		141		225		272		146		109		109	
# Nests hatched	19	18%	43	32%	86	53%	117	52%	94	40%	125	47%	128	66%	87	56%	70	41%	117	56%	90	51%	89	63%	56	59%	24	22%	73	54%	106	49%	153	56%	98	73%	30	40%	38	36%
Failed predator	70	66%	66	49%	50	31%	63	28%	98	41%	108	41%	21	11%	30	19%	74	44%	51	24%	35	20%	23	16%	20	21%	59	54%	46	34%	69	32%	48	18%	9	7%	29	39%	50	47%
Failed wind	3	3%	3	2%	4	2%	6	3%	6	3%	2	1%	5	3%	13	8%	5	3%	5	2%	12	7%	10	7%	6	6%	13	12%	1	1%	4	2%	20	7%	10	7%	0		0	
Failed abandoned	6	6%	5	4%	17	10%	18	8%	21	9%	17	6%	20	10%	11	7%	13	8%	26	12%	13	7%	6	4%	2	2%	8	7%	5	4%	11	5%	7	3%	5	4%	9	12%	7	7%
Failed tide	7	7%	16	12%	2	1%	18	8%	15	6%	12	5%	11	6%	13	8%	7	4%	7	3%	23	13%	11	8%	10	11%	5	5%	5	4%	21	10%	28	10%	10	7%	5	7%	8	7%
Failed human	0		0		0		0		0		0		0		0		0		1	0%	0		0		0		0		0		0		0		0		2	3%	4	4%
Failed other	0		1	1%	1	1%	0		1	0%	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Failed unknown	1	1%	0		3	2%	1	0%	2	1%	2	1%	5	3%	0		0		3	1%	4	2%	3	2%	1	1%	0		6	4%	7	3%	16	6%	2	1%	0		0	
Unknown fate	0		2		6		3		1		6		7		3		5		3		2		2		1		0		5		7		0		12		34		2	
Total # of Nests-ALL BEACHES	164		172		203		258		265		310		241		189		220		259		229		210		147		164		226		294		376		227		191		162	
# Nests Hatched-ALL BEACHES	24	15%	56	33%	94	48%	132	52%	99	38%	140	46%	142	61%	96	52%	78	36%	134	53%	104	46%	109	53%	72	51%	44	27%	103	47%	146	51%	177	47%	119	55%	70	45%	71	44%

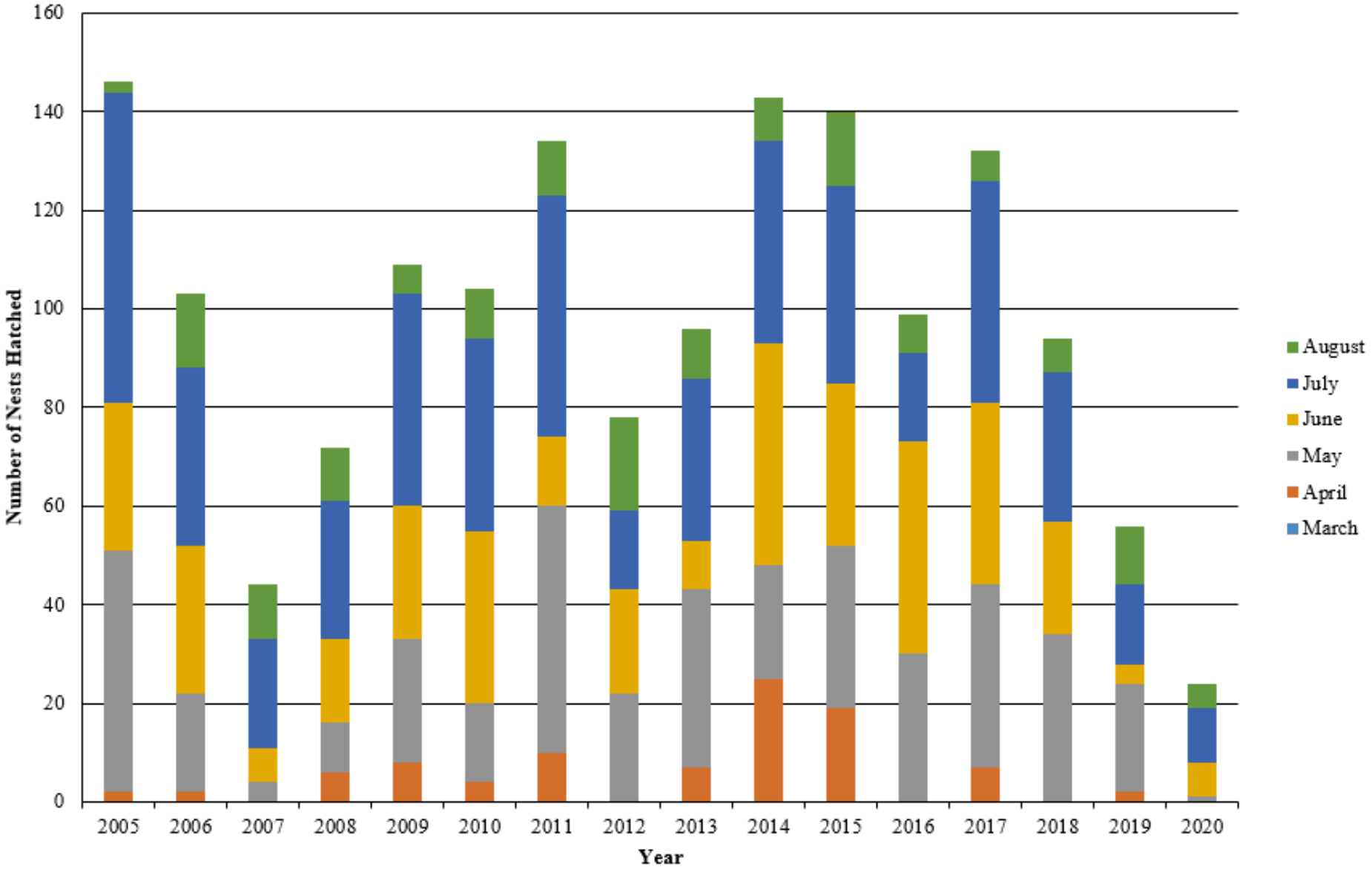
All percentage calculations exclude nests with unknown fates

NOTES
1. HSSSP was not monitored in 2001 and 2002-04 numbers only include San Simeon Creek Beach
2. Numbers for 2001-02 include City property

Appendix 10e - Total Nests Hatched on District Beaches 2001-2020



Appendix 10f - Nests Hatched by Month on District Beaches 2005-2020



Collected Eggs									
Nest #	**UTM**	**Date Found**	**Clutch Size**	**Nest Fate**	**Cause of Failure**	**Fate Date**	**# of Eggs Collected**	**Date Collected**	**Collected By**
Villa Creek Beach									
VC11	10 S 684596 3925883	06/08/20	3	Hatch	N/A	07/06/20	2	07/15/20	R Orr
Morro Strand									
MS03	10 S 693977 3917632	04/03/20	1	Fail	Wind	04/06/20	1	04/09/20	R Orr
MS13	10 S 693979 3918160	05/04/20	1	Fail	Abandoned	05/14/20	1	05/14/20	R Orr
MS15	10 S 693922 3918238	05/09/20	2	Fail	Abandoned	06/10/20	2	06/22/20	S Ontiveros
MSDE01	10 S 693580 3919580	05/27/20	1	Dropped Egg	N/A	N/A	1	06/01/20	R Orr
MSDE02	10 S 693645 3919303	06/13/20	1	Dropped Egg	N/A	N/A	1	06/17/20	R Orr
Sandspit									
North									
NSS012	10 S 694103 3912689	04/21/20	1	Fail	Abandoned	04/29/20	1	04/29/20	R Orr
NSS013	10 S 693976 3911928	04/21/20	1	Fail	Wind	04/22/20	1	04/23/20	R Orr
NSS014	10 S 694027 3912245	04/28/20	3	Fail	Tide	04/29/20	2	04/29/20	R Orr
NSS019	10 S 694221 3913720	04/30/20	3	Fail	Tide	05/05/20	1	05/06/20	R Orr
NSS032	10 S 694046 3912283	05/29/20	3	Fail	Wind	06/08/20	3	06/08/20	S Ontiveros
NSS033	10 S 694154 3912680	06/01/20	3	Hatch	N/A	06/15/20	1	06/18/20	R Orr
NSS035	10 S 694075 3911987	06/11/20	1	Fail	Abandoned	06/19/20	1	06/19/20	S Ontiveros
NSS036	10 S 694173 3913071	06/18/20	3	Fail	Abandoned	07/08/20	3	07/08/20	R Orr
NSS041	10 S 694154 3912816	06/19/20	3	Fail	Abandoned	07/07/20	3	07/13/20	S Ontiveros
NSS047	10 S 694151 3912928	07/13/20	2	Fail	Abandoned	07/27/20	2	07/27/20	S Ontiveros

NSSDE01	10 S 694032 3912294	08/17/20	1	Dropped Egg	N/A	N/A	1	09/01/20	R Orr
South									
SSS033	10 S 693655 3910289	06/05/20	2	Fail	Wind	06/08/20	2	06/10/20	R Orr
SSS051	10 S 693668 3910516	07/08/20	3	Hatch	N/A	08/06/20	1	08/10/20	S Ontiveros
SSS052	10 S 693678 3910564	07/08/20	3	Hatch	N/A	07/30/20	1	08/07/20	S Ontiveros
SSSDE02	10 S 692958 3908041	07/02/20	1	Dropped Egg	N/A	N/A	1	07/06/20	S Ontiveros

Salvaged WSP Specimens					
Descriptive Location	**UTM**	**Age**	**Specimen Description**	**Date Collected**	**Collected By**
Santa Rosa Creek Beach	10 S 671374 3937529	Adult	Found dead on beach with hole on ventral side. Necropsy by CDFW determined cause of death to be acute trama. The cause of trauma was unknown, but injuries were suggestive of a predation event.	01/02/20	Elizabeth Bettenhausen


Estero Bluffs
State Park
Villa Creek Beach
San Luis Obispo County, CA
Western Snowy Plover
Charadrius nivosus nivosus
Villa Creek
N
1
2020 Nest Fates
Hatch
Predator Fail
American Crow
Coyote
Unknown Avian
Unknown Corvid
Unknown Predator
NAD 1983
California State Plane Zone 5
2010, 2012 NAIP Imagery
State of California
Department of Parks & Recreation
San Luis Obispo Coast District
Created by Seth Ontiveros
September 2020
0
500
1,000
Feet
CALIFORNIA STATE PARKS


Morro Strand State Beach
Map 1
San Luis Obispo County, CA
Western Snowy Plover
Charadrius nivosus nivosus
Kiosk
North Bathroom
South Bathroom
Alva Paul
Hatteras Street Corridor
Easter Street Corridor
Sienna Street Corridor
Azure Street Corridor
2020 Nest Fates
Predator Fail
American Crow
Striped Skunk
Unknown Avian
Unknown Predator
0
500
1,000
Feet
NAD 1983
California State Plane Zone 5
2005, 2012 Aerial Imagery
State of California
Department of Parks & Recreation
San Luis Obispo Coast District
Created by Seth Ontiveros
September 2020


Morro Strand State Beach
Map 2
San Luis Obispo County, CA
Western Snowy Plover
Charadrius nivosus nivosus
2020 Nest Fates
Predator Fail
American Crow
Red Fox
Striped Skunk
Unknown Avian
Unknown Predator
Other Fail
Abandoned
Wind
0
500
1,000
Feet
NAD 1983
California State Plane Zone 5
2005, 2012 Aerial Imagery
State of California
Department of Parks & Recreation
San Luis Obispo Coast District
Created by Seth Ontiveros
September 2020
Azure Street Corridor
Boardwalk Corridor
Highway 41 Corridor
N
CALIFORNIA STATE PARKS


Montaña de Oro
State Park
Sandspit 1
San Luis Obispo County, CA
Western Snowy Plover
Charadrius nivosus nivosus
2020 Nest Fates
Other Fail
Abandoned
Tide
Predator Fail
Unknown Avian
Unknown Corvid
Unknown Predator
Hatch
State Park Boundary
RM8
State Park Corridor
RM6
N
0
500
1,000
Feet
NAD 1983
California State Plane Zone 5
2005, 2014 NAIP Imagery
State of California
Department of Parks & Recreation
San Luis Obispo Coast District
Created by Seth Ontiveros
September 2020


Montaña de Oro
State Park
Sandspit 2
San Luis Obispo County, CA
Western Snowy Plover
Charadrius nivosus nivosus
2020 Nest Fates
Hatch
Predator Fail
American Crow
Common Raven
Coyote
Unknown Avian
Unknown Corvid
Unknown Predator
Other Fail
Abandoned
Tide
Wind
P A C I F I C
O C E A N
RM5
RM4
Rocky Mounds
N
0
500
1,000
Feet
NAD 1983
California State Plane Zone 5
2005, 2012 NAIP Imagery
State of California
Department of Parks & Recreation
San Luis Obispo Coast District
Created by Seth Ontiveros
September 2020


Montaña de Oro
State Park
Sandspit 3
San Luis Obispo County, CA
Western Snowy Plover
Charadrius nivosus nivosus
2020 Nest Fates
Hatch
Predator Fail
American Crow
Common Raven
Coyote
Unknown Avian
Unknown Predator
Other Fail
Tide
Unknown Fail
Rocky Mounds
RM3
RM2
NAD 1983
California State Plane Zone 5
2005, 2014 NAIP Imagery
State of California
Department of Parks & Recreation
San Luis Obispo Coast District
Created by Seth Ontiveros
September 2020
0
500
1,000
Feet


Montaña de Oro
State Park
Sandspit 4
San Luis Obispo County, CA
Western Snowy Plover
Charadrius nivosus nivosus
2020 Nest Fates
Hatch
Predator Fail
American Crow
Common Raven
Coyote
Unknown Corvid
Unknown Predator
Other Fail
Wind
RM2
Sharks Inlet Corridor
RM1
Army Road
Rim Trail
N
0
500
1,000
Feet
NAD 1983
California State Plane Zone 5
2005, 2014 NAIP Imagery
State of California
Department of Parks & Recreation
San Luis Obispo Coast District
Created by Seth Ontiveros
September 2020


Montaña de Oro
State Park
Sandspit 5
San Luis Obispo County, CA
Western Snowy Plover
Charadrius nivosus nivosus
2020 Nest Fates
Hatch
Predator Fail
American Crow
Common Raven
Coyote
Unknown Avian
Unknown Corvid
Unknown Predator
Rim Trail
Sandspit Trail
Amerloan Canyon Trail
Cables Trail
NAD 1983
California State Plane Zone 5
2005, 2014 NAIP Imagery
State of California
Department of Parks & Recreation
San Luis Obispo Coast District
Created by Seth Ontiveros
September 2020
0
500
1,000
Feet

Appendix 13 – Summary of WSP Nest Depredations on District Beaches 2001-2020

	2020		2019		2018		2017		2016		2015		2014		2013		2012		2011		2010		2009		2008		2007		2006		2005		2004 [2]		2003 [2]		2002 [1, 2]		2001 [1, 2]	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Hearst San Simeon State Park																																						
Total # of nests	0		0		1		2		1		1		0		0		3		0		0		2		2		6		11		5		0		1		1		N/A	
Total Depredated	0		0		1		1		0		0		0		0		0		0		0		1		0		0		0		0		0		1		0			
Coyote	0		0		1	100%	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Red Fox	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Domestic Dog	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Striped Skunk	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
American Crow	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	100%	0			
Raccoon	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Gull Species	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Unknown Mammal	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Unknown Avian	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Unknown Predator	0		0		0		1	100%	0		0		0		0		0		0		0		1	100%	0		0		0		0		0		0		0			
Other	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Unknown fate	0		0		0		1		1		0		0		0		0		0		0		0		0		0		0		0		0		0		0			
Villa Creek Beach																																						
Total # of nests	14		18		21		14		10		24		23		20		31		21		26		38		16		30		40		37		66		35		44		39	
Total Depredated	9		10		10		1		5		10		10		13		24		10		13		25		3		16		21		14		29		13		8		6	
Coyote	1	11%	1	10%	8	80%	0		0		0		1	10%	1	8%	0		0		3	23%	0		0		3	19%	0		0		1	3%	6	46%	0		1	17%
Red Fox	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Domestic Dog	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Unknown Canid	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		2	25%	0	
Striped Skunk	0		0		0		0		0		2	20%	2	20%	4	31%	1	4%	0		0		2	8%	1	33%	0		0		6	43%	7	24%	0		1	13%	0	
American Crow	1	11%	2	20%	0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	3%	0		0		0	
Unknown Corvid	1	11%	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Raccoon	0		0		0		0		0		1	10%	0		0		0		0		1	8%	2	8%	0		0		0		0		0		0		2	25%	0	
Gull Species	0		2	20%	0		0		1	20%	2	20%	1	10%	0		6	25%	0		2	15%	4	16%	2	67%	3	19%	7	33%	2	14%	2	7%	0		2	25%	2	33%
Ground Squirrel	0		0		0		0		0		0		0		0		2	8%	0		0		0		0		2	13%	0		0		0		0		0		0	
Unknown Mammal	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		2	15%	0		3	50%
Unknown Avian	5	56%	0		0		0		0		0		0		0		1	4%	0		0		0		0		0		0		0		0		0		0		0	
Unknown Predator	1	11%	4	40%	2	20%	1	100%	4	80%	5	50%	6	60%	8	62%	14	58%	10	100%	7	54%	17	68%	0		8	50%	14	67%	0		18	62%	4	31%	1	13%	0	
Other	0		1	10%	0		0		0		0		0		0		0		0		0		0		0		0		0		6	43%	0		1	8%	0		0	
Unknown fate	0		0		0		0		1		1		0		1		0		1		0		2		2		2		1		0		0		0		0		0	
Morro Strand																																						
Total # of nests	44		18		12		16		16		13		17		12		12		25		24		26		33		19		34		27		38		45		37		14	
Total Depredated	40		6		8		9		10		5		3		3		6		9		6		6		8		5		2		3		14		33		8		4	
Coyote	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Red Fox	5	13%	1	17%	3	38%	0		0		2	40%	0		2	67%	0		0		0		0		2	25%	0		1	50%	2	67%	0		3	9%	1	13%	3	75%
Domestic Dog	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Striped Skunk	13	33%	2	33%	2	25%	2	22%	2	20%	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
American Crow	7	18%	1	17%	2	25%	3	33%	5	50%	1	20%	0		1	33%	5	83%	4	44%	3	50%	5	83%	3	38%	2	40%	1	50%	0		11	85%	30	91%	6	75%	0	
Raccoon	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	25%
Gull Species	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	8%	0		1	13%	0	
Unknown Mammal	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Unknown Avian	3	8%	0		0		3	33%	3	30%	1	20%	0		0		0		0		0		0		1	13%	0		0		0		0		0		0		0	
Unknown Predator	12	30%	2	33%	1	13%	1	11%	0		1	20%	3	100%	0		1	17%	5	56%	3	50%	1	17%	2	25%	3	60%	0		1	33%	1	8%	0		0		0	
Other	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	8%	0		0		0	
Unknown fate	0		0		1		0		0		0		1		0		0		0		1		0		2		0		1		0		0		0		0		0	

Appendix 13 – Summary of WSP Nest Depredations on District Beaches 2001-2020

	2020		2019		2018		2017		2016		2015		2014		2013		2012		2011		2010		2009		2008		2007		2006		2005		2004 [2]		2003 [2]		2002 [1, 2]		2001 [1, 2]	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Sandspit																																							
Total # of nests	106		136		169		226		238		272		201		157		174		213		179		144		96		109		141		225		272		146		109		109	
Total Depredated	70		66		50		63		98		108		24		30		74		51		35		23		20		59		46		69		48		9		29		50	
Coyote	13	19%	15	23%	39	78%	55	87%	91	93%	106	98%	17	71%	6	20%	16	21%	10	20%	27	77%	22	96%	17	85%	9	15%	33	72%	28	41%	13	27%	0		0		0	
Red Fox	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	2%
Domestic Dog	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	2%
Striped Skunk	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		30	63%	7	78%	27	93%	43	86%
American Crow	4	6%	2	3%	0		2	3%	1	1%	0		1	4%	1	3%	0		15	30%	0		1	4%	0		0		0		5	7%	0		0		0		0	
Common Raven	5	7%	8	12%	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Unknown Corvid	16	23%	13	20%	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Raccoon	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Gull Species	0		0		0		0		0		0		0		0		11	15%	0		0		0		0		0		0		10	14%	0		0		0		0	
Unknown Mammal	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	2%	0		1	3%	2	4%
Unknown Avian	11	16%	22	33%	5	10%	2	3%	6	6%	2	2%	3	13%	22	73%	24	32%	5	10%	2	6%	0		0		45	76%	6	13%	11	16%	0		1	11%	0		0	
Unknown Predator	21	30%	6	9%	6	12%	4	6%	0		0		3	13%	1	3%	23	31%	20	39%	6	17%	0		3	15%	5	8%	7	15%	15	22%	2	4%	1	11%	0		3	6%
Other	0		0		0		0		0		0		0		0		0		1	2%	0		0		0		0		0		0		1	2%	0		1	3%	0	
Unknown fate	0		2		6		3		1		6		7		3		5		3		2		2		1		0		5		7		0		12		34		2	
Total # of Nests- ALL BEACHES	**164**		**172**		**203**		**258**		**265**		**310**		**241**		**189**		**220**		**259**		**229**		**210**		**147**		**164**		**226**		**294**		**376**		**227**		**191**		**162**	
# Nests Depredated- ALL BEACHES	**119**	**73%**	**82**	**48%**	**69**	**35%**	**74**	**29%**	**113**	**43%**	**123**	**41%**	**37**	**16%**	**46**	**25%**	**104**	**48%**	**70**	**27%**	**54**	**24%**	**55**	**27%**	**31**	**22%**	**80**	**49%**	**69**	**32%**	**86**	**30%**	**91**	**24%**	**56**	**26%**	**45**	**29%**	**60**	**38%**

NOTES

1. Numbers for 2001-02 include City property.

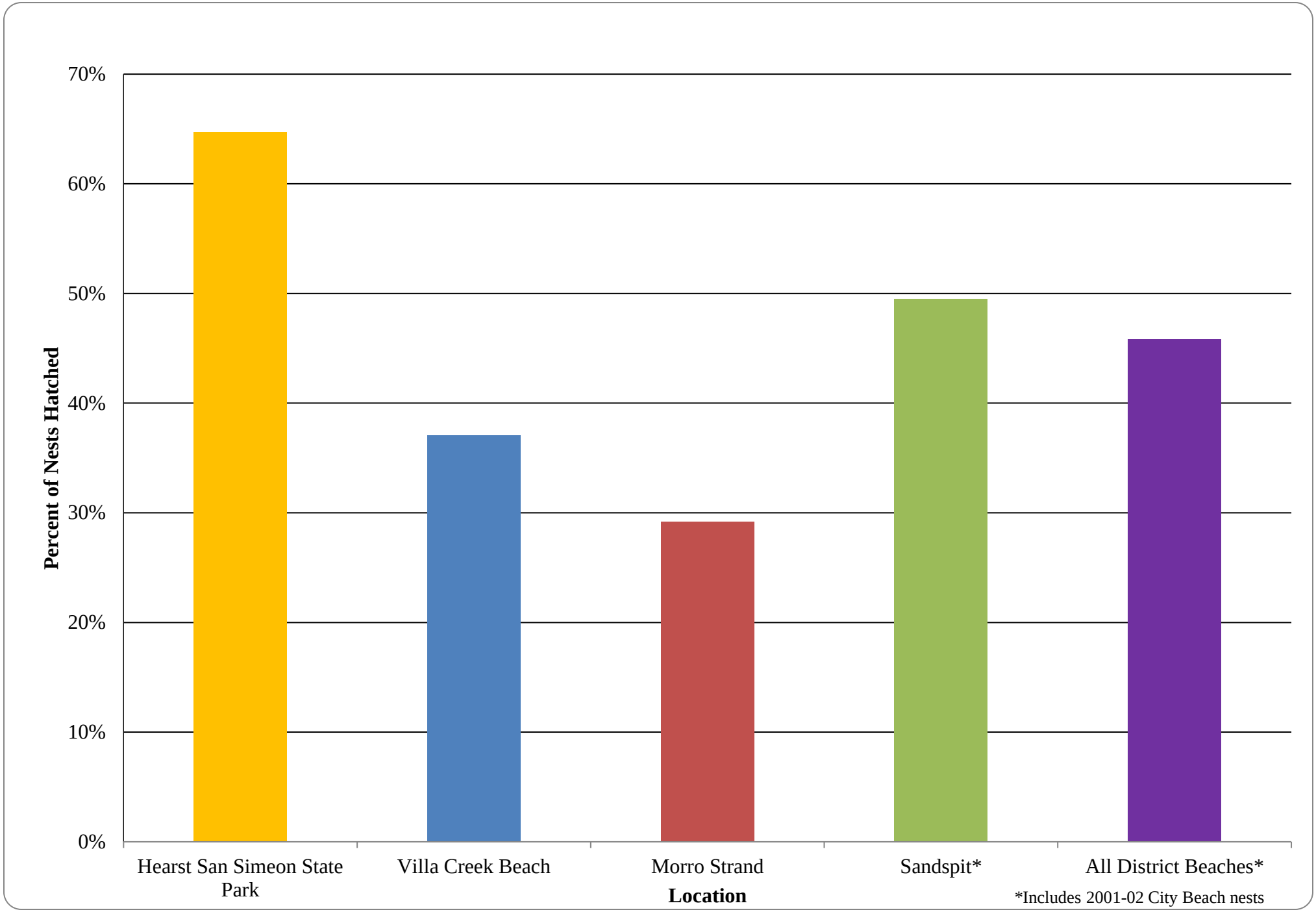
2. HSSSP was not monitored in 2001 and 2002-04 numbers only include San Simeon Creek Beach.

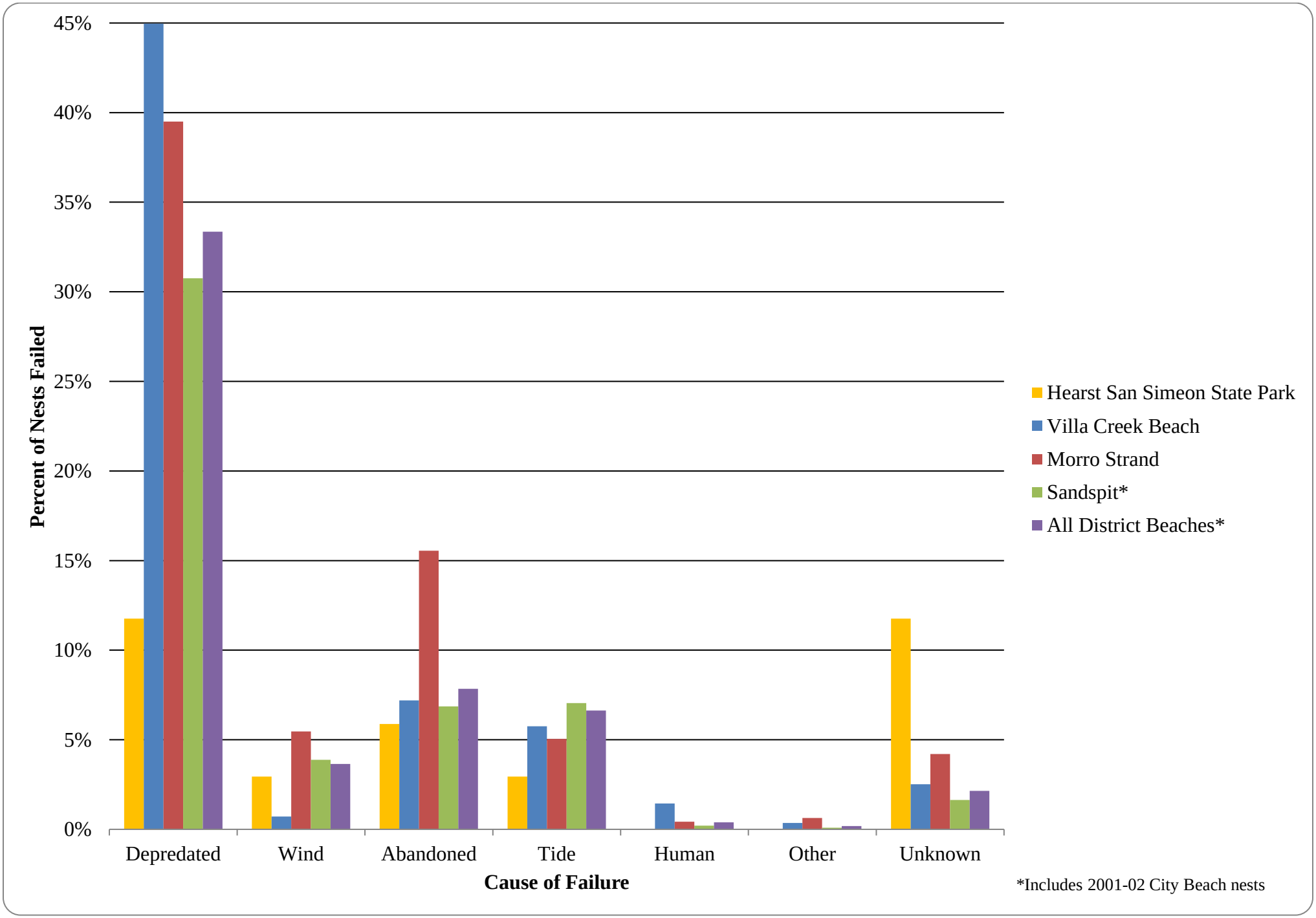
Appendix 14 – Exclosed vs. Unexclosed Nest Fates at Morro Strand 2003-2020

	2020 [2]		2019		2018		2017		2016		2015		2014 [3]		2013		2012		2011		2010		2009		2008		2007 [4]		2006 [5]		2005 [6]		2004 [7]		2003	
Exclosure Type: Large (> 10 ft. diameter)																																		
# of nests exclosed, % of total nests	**10**	**23%**	0	0%	0	0%	5	31%	0	0%	0	0%	7	41%	7	58%	5	42%	14	56%	14	58%	16	62%	11	33%	7	37%	31	91%	25	93%	22	58%	0	0%
Nests hatched [1]	**0**		0		0		5		0		0		1		3		2		10		8		14		6		2		7		19		8		0	
Nests depredated	**9**		0		0		0		0		0		0		0		0		0		1		0		0		0		1		1		3		0	
Failed, adult mortality	**0**		0		0		0		0		0		1		0		0		0		0		0		0		0		3		0		0		0	
Failed, abandoned	**1**		0		0		0		0		0		3		2		2		2		2		2		3		5		18		3		6		0	
Failed, other causes	**0**		0		0		0		0		0		2		2		1		2		2		0		2		0		1		2		5		0	
Unknown fate	**0**		0		0		0		0		0		0		0		0		0		1		0		0		0		1		0		0		0	
Number adults depredated in/near nest	**0**		0		0		0		0		0		1		0		0		0		0		0		0		0		3		1		0		0	
Number adults entangled in net top	**0**		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1		2		0	
Exclosure Type: None																																				
# of nests unexclosed, % of total nests	**34**	**77%**	18	100%	12	100%	11	69%	16	100%	13	100%	10	59%	5	42%	7	58%	11	44%	10	42%	10	38%	22	67%	12	63%	3	9%	2	7%	16	42%	45	100%
Nests hatched [1]	**0**		9		2		0		3		5		4		1		0		0		0		0		0		5		2		0		0		3	
Nests depredated	**31**		6		8		9		10		5		3		3		6		9		5		6		8		5		1		2		11		33	
Failed, abandoned	**1**		0		1		1		2		1		1		1		0		0		3		1		3		1		0		0		0		1	
Failed, other causes	**2**		3		0		1		1		2		1		0		1		2		2		3		9		1		0		0		5		8	
Unknown fate	**0**		0		1		0		0		0		1		0		0		0		0		0		2		0		0		0		0		0	

NOTES

1. Nests hatching at least one chick.
2. Used 2.5'x 2.5'x 3' exclosures.
3. Nest depredation with exclosures occurred after the nests had failed due to either wind or abandonment. Adult found dead inside exclosure 30 days after being abandoned; suspect predation but the cause of death could not be determined to due to the high level of decomposition and dehydration of the carcass.
4. Red fox circling exclosures. Began adding "wings" and "spikes" to some exclosures.
5. Red-tailed Hawk perching on exclosures and changed net top to 1"x 1".
6. Great Horned Owl found inside exclosure.
7. Three American Crows found inside exclosures and red fox tracks often seen around exclosures.


70%
60%
50%
40%
30%
20%
10%
0%
Percent of Nests Hatched
Hearst San Simeon State Park
Villa Creek Beach
Morro Strand
Sandspit*
All District Beaches*
Location
*Includes 2001-02 City Beach nests


45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Percent of Nests Failed
Depredated
Wind
Abandoned
Tide
Human
Other
Unknown
Cause of Failure
Hearst San Simeon State Park
Villa Creek Beach
Morro Strand
Sandspit*
All District Beaches*
*Includes 2001-02 City Beach nests